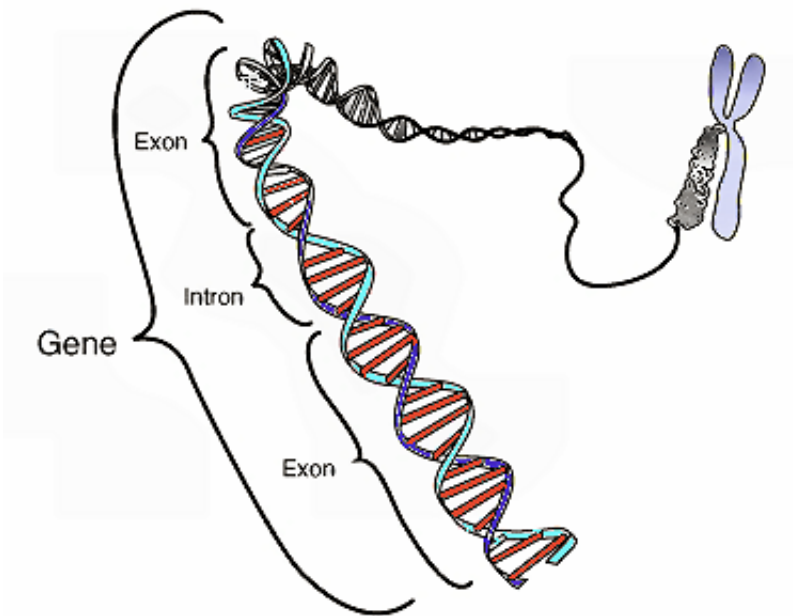


# Fertility experts identify genetic pattern in womb linked to IVF failure

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This image shows the coding region in a segment of eukaryotic DNA. Credit: National Human Genome Research Institute

Fertility experts in Southampton and the Netherlands have identified a specific genetic pattern in the womb that could predict whether or not IVF treatment is likely to be successful.

Study co-lead Professor Nick Macklon, chair in obstetrics and gynaecology at the University of Southampton, said the discovery would help clinicians understand why IVF fails repeatedly in some women.

He said it could also lead to the development of a new test to help patients understand how likely they are to achieve a pregnancy before they embark on the treatment process - and to guide others on whether or not they should continue even after a number of unsuccessful cycles.

"Many women undergo a number of IVF cycles without success despite having good quality embryos and, up to now, it has been unclear whether or not the lining of the womb may be the cause of that," explained Prof Macklon, medical director of Complete Fertility Centre Southampton, which is based at the city's Princess Anne Hospital and part of the NIHR Southampton Biomedical Research Centre.

"We have now shown that an [abnormal gene](#) expression in the lining can be identified in many of these women and that a specific gene 'fingerprint', when present, is always associated with failure, which is very significant in aiding our understanding of IVF failure."

Patients were recruited for the study, published online in the journal *Scientific Reports*, at the University Medical Center Utrecht between 2006 and 2007 and at both Utrecht and the Academic Medical Center in Amsterdam between 2011 and 2013.

Researchers obtained biopsies of the lining of the womb from 43 women with recurrent implantation failure, which occurs when three or more transfers of high quality embryos or the placement of ten or more embryos in multiple transfers fail to result in pregnancy, and 72 women who gave birth after IVF or intra-cytoplasmic sperm injection (ICSI).

During analysis of the biopsies in Utrecht and Southampton, they found an abnormal gene profile in the lining of the womb in 80 per cent of women with recurrent implantation failure that was not present among women who had given birth after IVF treatment.

Professor Frank Holstege, head of the genomics laboratory at University Medical Center Utrecht, said: "What this tells us is that a large proportion of [women](#) who suffer recurrent implantation failure may be infertile due to a problem with the receptivity of their uterus.

"Their chances of achieving successful pregnancy are likely to be very small and this information gives clinicians much more clarity in counselling patients as to the wisdom of investing further time, effort and money in ongoing treatment.

"At the same time, those patients who have undergone a number of unsuccessful cycles of IVF but do not have the genetic pattern could be advised to persist as they have a much better chance of achieving a pregnancy."

Professor Macklon, a consultant gynaecologist at University Hospital Southampton NHS Foundation Trust, added: "While we believe this finding to be a very significant development in international fertility research, the next stage is to trial it as a clinical test to study its effectiveness on a wider scale."

**More information:** Yvonne E. M. Koot et al. An endometrial gene expression signature accurately predicts recurrent implantation failure after IVF, *Scientific Reports* (2016). [DOI: 10.1038/srep19411](https://doi.org/10.1038/srep19411)

Provided by University of Southampton

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