

Novel technique could help boost IVF success and reduce multiple pregnancies

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A new technique successfully used in mice to identify embryos likely to result in a successful pregnancy could be used in humans, potentially boosting IVF success rates and helping to reduce the number of multiple births (1), according to Cardiff University scientists.

The findings, published in the international journal, [Fertility and Sterility](#) and funded by the Wellcome Trust, used an [advanced imaging](#) technique to track the discrete movements inside an egg that occur during stimulation at fertilization.

The Cardiff scientists worked with a team in Oxford University to analyse the internal contents of the human egg or [cytoplasm](#) to observe distinct rhythmic patterns.

"Current [IVF treatment](#) involves fertilising eggs in the laboratory and then choosing those embryos considered to be the healthiest for implantation into the mother's womb, using selection criteria such as the number and appearance of cells produced during the division process," according to Professor Karl Swann from Cardiff University's School of Medicine, who led the research.

"However, the implantation of selected eggs using current methods requires days in culture and does not always succeed."

"We already know from previous research in mice that sperm entry into the mouse egg triggers "rhythmic cytoplasmic motions", which may help

to predict successful [embryo development](#). Adopting this key method we have now been able to show that the same type of [rhythmic movements](#) occur in [human eggs](#)," he added.

Eggs that had failed to fertilise following IVF treatment were donated by patients attending the IVF Wales clinic, the fertility unit at Cardiff's University Hospital of Wales. In a HFEA-approved procedure, the eggs were injected with an egg-activating sperm-specific protein ('PLC-zeta') and then imaged over a period of several hours.

The scientists were able to view distinct internal movements or spasms which is the first time that they have been detected in human eggs. These movements correlate exquisitely with the exact timing of biochemical changes occurring at fertilisation. The scientists hope that this information could help provide an early and effective indication of viability of a successful pregnancy in human IVF.

Professor Swann added: "Previous analysis of mouse fertilisation have suggested that using this technique may provide an early and effective indication of a successful pregnancy after IVF. We have now discovered that this method has the potential to be applied to human eggs.

"There is still a great deal of additional research to confirm whether these movements directly correlate with positive pregnancy – but this technique holds the promise of predicting the best embryo for IVF which should help cut down multiple pregnancies that often occurs during IVF treatment as a result of transferring several embryos at a time."

More information: (1) 'The single biggest risk of fertility treatment is multiple pregnancy.' - www.hfea.gov.uk/530.html

Provided by Cardiff University

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