

New Sperm shaker set to improve IVF success rates

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Scientists have developed a ground-breaking method for testing the quality of a sperm before it is used in IVF and increase the chances of conception.

Researchers at the University of Edinburgh, funded by the EPSRC (Engineering and Physical Sciences Research Council), have created a way of chemically ‘fingerprinting’ individual sperm to give an indication of quality. Scientists can then consider whether the sperm is healthy enough to be used to fertilise an egg as part of an IVF treatment.

The sperm are captured in two highly focussed beams of laser light. Trapped in what are essentially ‘optical tweezers’, an individual sperm’s DNA properties are identified by the pattern of the vibrations they emit in a process known as Raman spectroscopy. This is the first time this process has been used to evaluate DNA damage in sperm.

Dr Alistair Elfick, lead scientist on the project, said: “In natural conception the fittest and healthiest sperm are positively selected by the arduous journey they make to the egg. What our technology does is to replace natural selection with a DNA based ‘quality score’. But this is not about designer babies. We can only tell if the sperm is strong and healthy not if it will produce a baby with blue eyes.”

In the past quality tests of sperm have mostly been carried out on the basis of shape and activity. While these do give some indication of health of the sperm they do not give its DNA status.

There are established tests for sperm DNA quality but they work by cutting the cells in half and tagging them with fluorescent dye - a process that kills the sperm and renders it useless. This new process does not destroy the sperm, so if it is found to have good DNA quality, it can still be used in IVF treatment.

Conception rates in both IVF treatment and intercourse are at around one in four. By selecting the best quality sperm it is hoped this new process could both increase a couple's chances of conception and give the child the best potential start in life.

The research is currently in a pre-clinical phase, and if successful could be available to patients in the next five to ten years.

Provided by EPSRC

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