

## News from Renishaw

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# Pioneering work provides hope in fertility struggle

**Researchers have developed a new use for Renishaw's Raman spectroscopy solutions in assessing the healthiness of sperm cells.**

The inability to have children creates great heartache for many couples. The most common cause is male infertility, usually characterised by sperm cells with low mobility in which genetic material (DNA) is often damaged. Unfortunately, DNA damage in sperm cells is difficult to spot, and most techniques that can identify it require sperm to be broken open prior to chemical analysis, thereby destroying the sperm.

A non-destructive method of testing sperm DNA is needed. Using the inVia Raman microscope, research teams at the Universities of Edinburgh and California are attempting to develop just that by experimenting on live sperm. After immobilising a wriggling sperm with a tightly focused laser beam (a technique known as optical tweezing), it can then be analysed by Raman spectroscopy. Head researcher Dr Alistair Elfick comments, "the flexibility of both the inVia system and Renishaw personnel was key in enabling us to customise the instrument to integrate optical tweezing."

The resulting Raman spectra contain information about the vibrations of molecules within the sperm, and can be used to assess the state of its DNA. A statistical model to predict the healthiness of sperm using the Raman spectra is currently being developed, offering the potential of rapid health reporting for individual sperm cells. The best sperm could then be selected for IVF treatment, maximising the chances of successful fertilisation and potentially leading to more happy couples.

Naturally, a healthy egg is also needed, and Raman spectroscopy could also be used to assess the egg cells. As Dr Elfick concludes, "we are looking forward to more exciting work applying Raman to characterise cells for *in vitro* fertilisation both for human reproduction and for artificial insemination for domesticated animals."

*Renishaw plc are manufacturers of Raman spectroscopy products. The inVia Raman microscope is the world's best selling research-grade Raman microscope.*

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