

'Kick-starting' male fertility

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Adding a missing protein to infertile human sperm can 'kick-start' its ability to fertilise an egg and dramatically increase the chances of a successful pregnancy, a team of Cardiff University scientists have uncovered.

The team from Cardiff University's School of Medicine first found that sperm transfers a vital protein, known as PLC-[zeta](#) (PLCz), to the egg upon fertilisation. This sperm protein initiates a process called 'egg activation' which sets off all the [biological processes](#) necessary for development of an embryo.

Now, the team has found that eggs that don't fertilise because of a defective PLCz, as in some forms of [male infertility](#), can be treated with the active protein to produce egg activation. The added PLCz kick-starts the fertilisation process and significantly improves the chance of a successful pregnancy.

"We know that some men are infertile because their sperm fail to activate eggs. Even though their sperm fuses with the egg, nothing happens. These sperm may lack a proper functioning version of PLCz, which is essential to trigger the next stage in becoming pregnant," said Professor Tony Lai, who together with Professor Karl Swann led the research team at Cardiff University's Institute of Molecular and [Experimental Medicine](#).

"What's important from our research is that we have used [human sperm](#) PLCz to obtain the positive results that we had previously observed only

in experiments with mice.

"In the lab we have been able to prepare human PLCz protein that is active. If this protein is inactive or missing from sperm, it fails to trigger the process necessary for egg activation - the next crucial stage of [embryo development](#).

"However, when an unfertilised egg is injected with human PLCz, it responds exactly as it should do at fertilisation, resulting in successful embryo development to the blastocyst stage, vital to pregnancy success," he added.

Published online by the journal [Fertility and Sterility](#) (Friday 21st September, 2012) and funded by the Wellcome Trust, the work strengthens the potential use of PLCz in treating male infertility.

Professor Tony Lai adds: "We've established that this one sperm protein, PLCz, is absolutely critical at the point where life begins.

"Whilst this was a lab experiment and our method could not be used in a fertility clinic in exactly the same way – there is potential to translate this advance into humans.

"In the future, we could produce the human PLCz protein and use it to stimulate egg activation in a completely natural way. For those couples going through IVF treatment, it could ultimately improve their chances of having a baby and treat male [infertility](#)."

More information: 'Phospholipase C rescues failed oocyte activation in a prototype of male factor infertility' by Nomikos M. et al., *Fertility and Sterility*, will be published online: Friday 21st September, 2012.

Provided by Cardiff University

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