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**BBC**

**Enzyme 'switch' clue to infertility and miscarriage**

Scientists have identified a "fertility switch" protein which appears to increase infertility if levels are too high and fuel miscarriage if too low.

An Imperial College London team took samples from the womb lining of more than 100 women.

[Writing in Nature Medicine](http://press.nature.com/pdf/press_files/medicine/16-10-2011/nm.2498.pdf) they said women with unexplained infertility had high levels of the enzyme SGK1, while those who miscarried had low levels.

One fertility expert said the research offered new avenues for research.

About one in six women have difficulty getting pregnant, and one in 100 women trying to conceive experience recurrent miscarriages, defined as the loss of three or more consecutive pregnancies.

The Imperial team also carried out mouse studies which found levels of SGK1 in the womb lining decline during the window of time during which they can fall pregnant.

When extra copies of the SGK1 gene were implanted into the womb lining, these mice were unable to get pregnant.

The researchers say this suggests a fall in SGK1 levels is essential for making the uterus receptive to embryos.

However, if low levels of SGK1 persist into pregnancy, this appears to cause different problems.

When the researchers blocked the SGK1 gene, mice had no problem getting pregnant but they had smaller litters and showed signs of bleeding, suggesting a lack of SGK1 made miscarriage more likely.

'Focus for research'

Prof Jan Brosens, who led the research at Imperial's Institute of Reproductive and Developmental Biology, said: "Our experiments on mice suggest that a temporary loss of SGK1 during the fertile window is essential for pregnancy, but human tissue samples show that they remain high in some women who have trouble getting pregnant.

"I can envisage that in the future, we might treat the womb lining by flushing it with drugs that block SGK1 before women undergo IVF."

After an embryo is implanted, the lining of the uterus develops into a specialised structure called the decidua.

The team say lab tests show low levels of the enzyme may impair the ability of cells in the decidua to protect themselves against oxidative stress, a condition in which there is an excess of reactive chemicals inside cells.

Dr Madhuri Salker, who also worked on the study, said: "We found that low levels of SGK1 make the womb lining vulnerable to cellular stress, which might explain why low SGK1 was more common in women who have had recurrent miscarriage.

"In the future, we might take biopsies of the womb lining to identify abnormalities that might give them a higher risk of pregnancy complications, so that we can start treating them before they get pregnant."

Prof Richard Fleming, of the Glasgow Centre for Reproductive Medicine, said the research was "encouraging".

"To have something as clear as this, with a specific enzyme, is great.

It is giving us something to focus on."

But, Prof Fleming, who is also a member of the British Fertility Society, warned it would be some time before the discovery translated into day-to-day practice.

"It's all very well to measure something that is missing - whether or not you can correct it is the next step.

"But at least we know somewhere that's directly involved, and can explore that.

**Related Internet links**

* [British Fertility Society](http://www.britishfertilitysociety.org.uk/)
* [Nature Medicine](http://www.nature.com/nm/index.html)
* [Glasgow Centre for Reproductive Medicine](http://www.gcrm.co.uk/index.htm)

DAILY MAIL (London)

October 17, 2011 Monday

**PROTEIN THAT HOLDS THE KEY TO FERTILITY**  
**LENGTH:** 183 words

Scientists have found a 'fertility switch' that could lead to new treatments for infertility and miscarriages.

Too much of the protein SGK1 in the lining of the womb makes it harder to get pregnant, they discovered.

Lead researcher Professor Jan Brosens, of Imperial College London, said: 'Our experiments on mice suggest that a temporary loss of SGK1 during the fertile window is essential for pregnancy, but human tissue samples show that they remain high in some women who have trouble getting pregnant.

In the future, we might treat the womb lining by flushing it with drugs that block SGK1 before women undergo IVF.'

But the treatment would have to have a short-lived effect, as low levels of the protein after conception seem to be linked to miscarriages.

Even if scientists cannot find a way to block the protein, they might be able to do a test to find out if a woman is more likely to have pregnancy problems so she could decide whether to try for a baby.

Other possibilities include creating a contraceptive that stops pregnancy by raising levels of SGK1, the journal Nature Medicine reports.

**REUTERS**

**"Fertility switch" points to new treatments: study**

By Kate Kelland

LONDON | Sun Oct 16, 2011 6:11pm BST

Scientists have discovered an enzyme that acts as a "fertility switch" and say their findings could help treat infertility and miscarriage and may also lead to new contraceptives.

A study in the journal Nature Medicine Sunday reports that researchers at Imperial College London found high levels of a protein called SGK1 are linked with infertility, while low levels of it make a woman more likely to have a miscarriage.

Enzymes are proteins that catalyze, or increase the rates of, chemical reactions.

Jan Brosens, who led the study at Imperial and is now at Warwick University, said its results suggested new fertility and miscarriage treatments could be designed around SGK1.

"I can envisage that in [the futurehttp://images.intellitxt.com/ast/adTypes/icon1.png](http://uk.reuters.com/article/2011/10/16/health-us-fertility-switch-idUKTRE79F1OP20111016), we might treat the womb lining by flushing it with drugs that block SGK1 before women undergo IVF (in vitro fertilization)," he said in a statement.

"Another potential application is that increasing SGK1 levels might be used as a new method of contraception."

Infertility is a worldwide problem that experts estimate to affect between 9 and 15 percent of people of child-bearing age.

More than half of those affected will seek medical advice in the hope of eventually being able to become a parent.

Around one in 100 women trying to conceive have recurrent miscarriages, defined as the loss of three or more consecutive pregnancies.

In this study, Brosens' team looked at tissue samples from the womb lining, donated by 106 women who were being treated either for unexplained infertility or recurrent miscarriage.

Those with unexplained infertility had been trying to get pregnant for two years or more, and the most common reasons for infertility had been ruled out.

The researchers found that the womb lining in these women had high levels of the enzyme SGK1, while the women suffering recurrent miscarriage had low levels of SGK1.

In further experiments using mice, the team found that levels of SGK1 in the womb lining decline during the fertile window in mice.

When the researchers implanted extra copies of an SGK1 gene into the womb lining, the mice were unable to get pregnant.

This suggests a fall in SGK1 levels is essential for making the uterus receptive to embryos, they said.

The researchers said any future infertility treatment that blocks SGK1 would need to have a short-term effect, since low SGK1 levels after conception seem to be linked to miscarriage.

"Low levels of SGK1 make the womb lining vulnerable to cellular stress, which might explain why low SGK1 was more common in women who have had recurrent miscarriage," said Madhuri Salker of Imperial college, who also worked on the study.

"In the future, we might take biopsies of the womb lining to identify abnormalities that might give them a higher risk of pregnancy complications, so that we can start treating them before they get pregnant."

The Mirror

October 17, 2011 Monday   
3 Star Edition

**FERTILITY HOPE**  
**SECTION:** NEWS; Pg. 19  
  
**LENGTH:** 161 words

A FAULTY fertility switch can stop women getting pregnant and cause miscarriages.

High levels of a protein called SGK1 can cause infertility but when there is not enough women are more likely to lose a baby.

Scientists hope the discovery will lead to treatments to ensure women have the right levels of the enzyme in their womb lining.

Imperial College London researchers looked at tissue samples from 106 women and expert Madhuri Salker said: "In the future, we might take biopsies of the womb lining to identify abnormalities that might give them a higher risk of pregnancy complications, so that we can start treating them before they get pregnant."

Professor Jan Brosens, formerly of ICL's reproductive and developmental biology institute, added: "In the future, we might treat the womb lining by flushing it with drugs that block SGK1 before women have IVF.

"Another potential application is that increasing SGK1 levels might be used as a new method of contraception."

The Sun (England)

October 17, 2011 Monday   
Edition 2;   
National Edition

**'FERTILITY SWITCH'**  
**SECTION:** NEWS; Pg. 6  
  
**LENGTH:** 95 words

A "FERTILITY switch" in the womb can make a woman less likely to conceive - or increase her risk of miscarriage, scientists have revealed.

High levels of an enzyme called SGK1 are linked to infertility, whereas low levels increase the chance of losing a baby.

Experts at Imperial College London made their findings after studying the womb linings from 106 women.

Professor Jan Brosens said drugs could be used to block the effects of SGK1 before IVF to boost the chance of the fertility treatment working.

Increasing the levels could act as a method of contraception, he added.