

# Optimal sperm cell traceable through temperature and caffeine

July 11 2016, by Janneke Van Den Elshout

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Credit: University of Twente

Scientists from the University of Twente have devised a technique to find the optimal sperm cell. The researchers have demonstrated that a single sperm starts moving its tail faster as the temperature rises, while this movement slows down when the environment becomes colder. Also, by adding a caffeine, the sperm cell starts moving differently. This application will help childless couples over time conceive with fertility

treatments such as in vitro fertilisation.

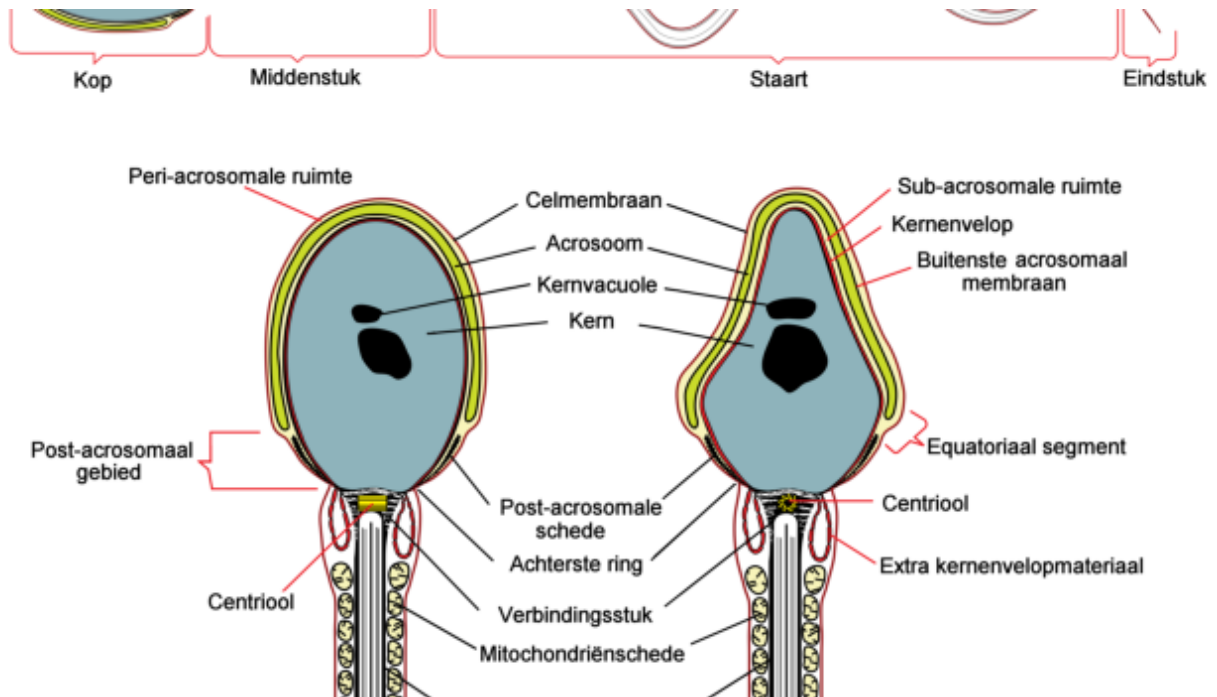
In a hospital, childless couples can undergo different kinds of fertility treatments, including for example, ICSI ([intracytoplasmic sperm injection](#)). This is a form of in vitro fertilisation. In this procedure, a single sperm cell is selected by a lab technician and injected into the egg of the woman. After cell division occurs, the embryo is transferred back into the uterus with the hope that this results in a successful pregnancy.

## Capturing sperm

In 2014, almost 7,000 ICSI treatments were initiated in the Netherlands. During the ICSI procedure, lab technicians select specific [sperm cells](#) from the sample. This selection is done based on the sperm cells' shape and mobility, after which the lab technician decides whether to inject it or not. To make this procedure more objective, scientists from the University of Twente have developed a microfluidic platform, which allows the researcher to capture a number of sperm cells.

## Electrodes

Researcher, Loes Segerink (UT institutes, MESA+ and MIRA): "We have placed electrodes close to the captured sperm cell, which allowed us to measure the tail movement by means of resistance measurements (see figure 1). Through various tests, we can measure the effect on the movement of the sperm cell." The researchers have demonstrated that a single sperm cell moves its tail faster as the temperature rises, whereas this movement slows down when the environment becomes colder. Also, adding a caffeine makes the sperm cell move in a different way.



Credit: University of Twente

Segerink: "Ultimately, we hope that such a platform can be used to select the optimal sperm cell, which can offer the greatest chance of a successful pregnancy." Until that time, much research is still needed into the properties of individual sperm cells and how these relate to fertility. In the coming years, scientists will focus more on this issue.

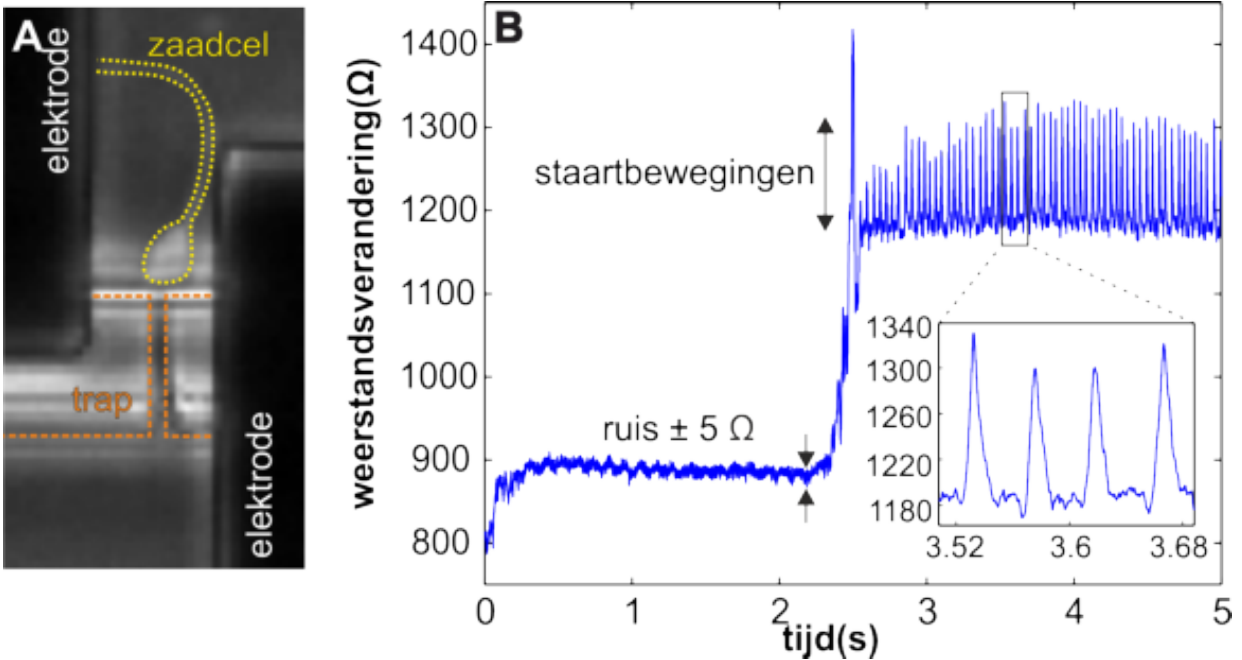


Figure 1: A sperm cell captured between the two electrodes and B the change in resistance which is measured by the two electrodes. At 2.5 seconds, a sperm cell is captured between the electrodes. This can be seen in the signal, which also shows the cell's tail movements. Credit: Wagenaar et al.

Provided by University of Twente

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