

Reliable Home Fertility Test in Sight

February 16 2010, by Wiebe van der Veen



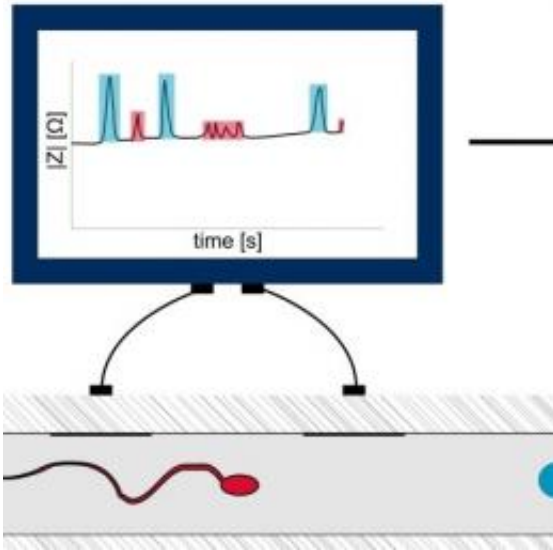
(PhysOrg.com) -- A new 'fertility chip', developed by researchers at the University of Twente's MESA+ Institute for Nanotechnology (The Netherlands), can accurately count spermatozoa in sperm. This is an important step towards the development of a compact device for reliable 'pre-scanning' of male fertility. The researchers are publishing the invention of the chip in the scientific journal *Lab on a Chip*.

Every year more than 10,000 couples in the Netherlands apply for help because of involuntary childlessness. A sperm analysis is typically the first step of fertility research. Testing sperm quality requires stringent pre-test preparations and a specialized laboratory. Tests often have to be

repeated two to five times for sufficient reliability. If men can carry out the tests in the privacy of their own home this makes the procedure much less awkward for them. Moreover, the probability of a reliable diagnosis is increased as well. Finally, the researchers think that the costs for health insurers can be decreased too.

The chip developed by researcher Loes Segerink can accurately count spermatozoa. Concentration is an important indication of the sperm count: the norm for fertility is 20 million spermatozoa per millilitre of ejaculate. Simple home tests are available, but these can only indicate that the sperm count is 'above or below the norm'. These tests are too limited because they do not actually measure the concentration of spermatozoa.

On the new chip, the spermatozoa flow through a fluid channel, above which electrodes are fitted. When a cell flows under this 'bridge', its electrical resistance changes momentarily, and this event is counted. It is important that the count distinguishes between spermatozoa and other particles or cells in the fluid: if other particles are included the count will be unreliable. Segerink added minuscule balls to the fluid to test its selectivity. The method proved to be selective enough to distinguish between the balls and the spermatozoa. White blood cells were also distinguished by the chip. The number of white blood cells tells us something about sperm quality and so this is important additional information for the gynaecologist.



Concentration is not the only indicator of sperm quality. Spontaneous activity - also known as motility - and the shape of the [spermatozoa](#) are also important factors. Further research will need to establish whether these two quality characteristics can be measured in a similar manner, so that a compact device can be developed in which a chip can be inserted for single use. The user will only be able to see that the test has been completed successfully; the gynaecologist will inform him of the actual results personally.

Loes Segerink developed the 'fertility chip' in Prof. Albert van den Berg's BIOS [Lab-on-a-Chip](#) research group. This group is part of the University of Twente's MESA+ Institute for [Nanotechnology](#). The research is financed by Technology Foundation STW.

More information: The publication 'On-chip determination of spermatozoa concentration using electrical impedance measurements' by Loes Segerink, Ad Sprenkels, Paul ter Braak, Istvan Vermes and Albert

van den Berg, has been published online in the form of an Advance Publication, and will appear in the scientific journal *Lab on a Chip* in the near future.

Provided by University of Twente

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