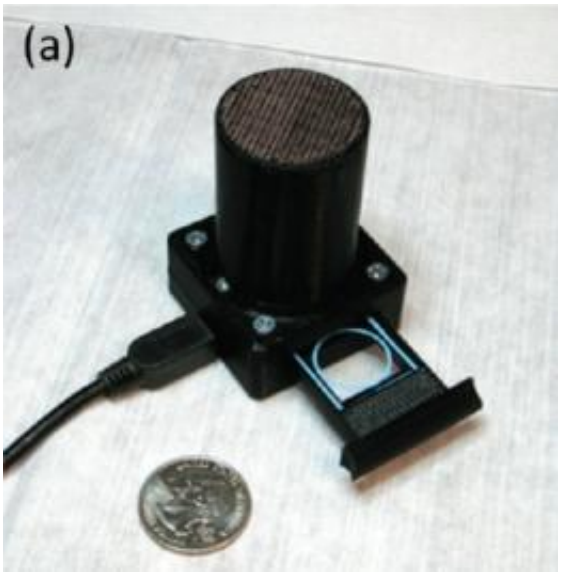
UCLA lens-free telemedicine microscope adds male fertility testing to its bag of tricks

October 11 2010, By Mike Rodewald



Lens-free telemedicine microscope. Aydogan Ozcan's lens-free telemedicine microscope (Credit: UCLA)

Using holographic imaging system, the microscope can produce phase and amplitude images of semen samples in the field and identify which are moving and which are immotile.

Despite the potential benefit of automated and portable male fertility testing, the current gold standard for semen analysis involves manually counting sperm and tracking those that are moving by viewing semen samples with an optical microscope — a method that is not feasible

outside of a laboratory setting. In addition, automated systems capable of matching the results of manual counting have proved too bulky and expensive for widespread use.

To provide a portable system capable of automatically counting sperm in the field, UCLA researchers have adapted their light-weight, lens-free telemedicine microscope for fertility testing. Through the use of a holographic imaging system, the telemedicine microscope can produce phase and amplitude images of saliva, blood, semen and other fluid samples. The system is capable of instantly counting the number of sperm in a sample, and by comparing 20 holographic images taken over 10 seconds, it can identify which are moving and which are immotile.

The lens-free telemedicine microscope fills an important gap between simple male fertility tests that determine the number of sperm in a sample and more sophisticated systems that also provide information on the movement of individual sperm. This technology provides a portable, automated system for semen analysis which could be used in fertility clinics, in personal male-fertility test kits and for veterinary medicine field applications, such as stud farming and animal breeding.

More information: This research was recently published in the journal *Analytical Chemistry* and is available online at pubs.acs.org/doi/abs/10.1021/ac101845q

Provided by University of California Los Angeles