New method of assessing women's eggs could enhance IVF success, study shows

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Many couples who have trouble conceiving a child have turned to a process known as in vitro fertilization. The resulting embryos are then transferred back into the woman or placed in storage. More than 400,000 embryos are currently in storage in the United States. The quality of the egg is often the single greatest factor in the viability of the embryo, yet fertility experts lack a good method for assessing the eggs.

Barry Behr, PhD, HCLD, associate professor of obstetrics and gynecology at the Stanford University School of Medicine and director of Stanford's IVF laboratory, recently published findings on a way to "profile" the eggs to determine which are more likely to result in pregnancies.

The question: Can a non-invasive test of a woman's eggs be used to predict in vitro fertilization success?

Background: In vitro fertilization involves retrieving eggs from a woman's ovaries and fertilizing the eggs in a dish by incubating them with sperm or injecting sperm directly into them. The resulting embryos are then transferred back into the woman or placed in storage. The quality of the egg is often the single biggest determinant in the viability of the embryo.

The need: There is currently no good tool to available to assess eggs. "We would stand on our head and hop on our left leg if we could find a way to give us some information about viability of embryo," said Behr.

The technology: Metabolomic testing reveals trace molecules remaining after an array of cellular processes. Previous studies have shown that metabolomic profiling can be used to identify unique biomarkers left behind by embryos in culture, which foretell the embryos with the highest reproductive potential in IVF. "Think of it as a sort of smog test for the embryo," said Behr. "It tells you how clean the engine is burning, and whether there are any problems."

The study: The study involved extracting eggs from 43 women, incubating them in culture for three hours and then examining their metabolomic results before fertilization. The researchers then documented what happened to each egg: Whether it was fertilized, the quality of the resulting embryo on days three and five, and whether it led to a successful pregnancy.

Publication: The study appeared in the February issue of *Reproductive Biomedicine Online*. Behr is the senior author; Jennifer Dasig, an embryologist at Stanford, is one of the co-authors.

The findings: The researchers established a correlation between the number of particular trace elements left behind by the eggs and both embryo viability and pregnancy rates. "This shows we can predict embryo development and viability from the egg," said Behr.

What's next: This is the first study to demonstrate that metabolomic profiling of the egg can generate important information about the resulting embryo. More studies are needed to confirm the results and to test in greater numbers.

Implications: If future studies confirm these results, the test could someday be used to predict the success of IVF and help determine which eggs should be selected for fertilization or to be frozen, Behr said. Using only the best-quality eggs would lead to the creation of fewer embryos

and eliminate the need to keep large quantities of embryos in storage. This could also help doctors avoid the practice of implanting numerous embryos into a woman, which sometimes leads to the birth of twins, triplets and higher-order multiples.

Source: Stanford University Medical Center ([news](#) : [web](#))

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