

New photo 'op' for ovaries may solve some mysteries of infertility

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What causes a woman's eggs to deteriorate in quality with age, and can that be reversed? How does the ovary choose an egg -- out of a stash of roughly one million -- to release for ovulation? And can the ovary be influenced to pick a "good" quality egg rather than one with chromosomal damage?

These questions are much on the mind of fertility researcher Teresa Woodruff. Woodruff, director of the Center for Reproductive Research at Northwestern University's Feinberg School of Medicine, hopes to find the answers and, with them, new treatments for fertility disease and age-related infertility. Her research, funded by a new \$6.5 million National Institutes of Health grant, has a novel approach.

Instead of measuring hormones and looking at genes -- the more traditional approaches to infertility research -- Woodruff and colleagues are studying the architecture and behavior of the ovaries.

"We're going to approach fertility disease from a new perspective," said Woodruff, the Thomas J. Watkins Professor of Obstetrics and Gynecology at the Feinberg School. "If we continue to look at the diseases of women's fertility traditionally, we're not going to solve the problems."

The inner daily workings of the ovary largely remain a mystery waiting to be solved.

"We don't understand how each follicle is selected to begin the process of ovulation," Woodruff said. "What caused this one to be selected when it's May and you're 19 years old while there might be one sitting right next to it quiescently for another 20 years before it is moved to the position where it can ovulate? Something controls or parcels those follicles over time so that you have enough from puberty until menopause."

There aren't many tools to help researchers examine the way ovaries function. Enter Frank Miller, M.D., who is developing a new imaging device to do exactly that.

"Ovaries are small and deep and they are more challenging to look at," said Miller, a professor of radiology at the Feinberg School and medical director of magnetic resonance imaging at Northwestern Memorial Hospital.

So he, along with colleagues in radiology, are designing a non-invasive magnetic resonance elastography device inspired by a larger one currently used for imaging livers.

Miller's new device will resemble a tiny drum, the size based on its future photo op with its subject - ovaries the size of walnuts. The device will generate sound waves ("like the sub-woofer system of a car," Miller says) to measure the rigidity of the ovaries.

Ovary rigidity is important to measure because it is one of the symptoms of polycystic ovary syndrome, a metabolic disease that is the leading cause of hormone-related infertility. In the syndrome, a woman's follicles do not function or ovulate normally.

"We hope that we will soon be able to understand more about age-related infertility and polycystic ovary syndrome," Woodruff said. "We're

tackling problems that have been difficult to solve."

Source: Northwestern University

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