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Celmatix's "Game Changing" Fertility Diagnostic Tools Allow Women to Watch Their Own Unique Biology Clock

By Bari Faye Siegel

Remember playing "house" as a kid? Someone was the mother and someone was the father and others were the children - because that's how house is "played." Real life is another story entirely. The issue of having children, for millions, has long been a question of age. A woman in her 20s and 30s may choose to focus on relationships, interests or career. All of a sudden, she fears time is running out on her chances of having a baby. By then, she still may not be ready - or she may conclude it's just too late.

Celmatix, a personalized medicine company based in New York City, is poised to change the way all prospective parents think about fertility. Look to science, not the calendar, Celmatix founder and CEO Piraye Yurttas Beim, Ph.D. says, because no two women's "biological clocks" are the same.

Dr. Beim and the other renowned fertility experts at Celmatix believe a woman's ability to conceive, quite frankly, is as personal as her decision to have a baby; and a lot of it is hard-wired in the DNA she inherited.

"We are redefining women's health by bringing a game-changing product into the market. Right now, many women make decisions about when to start their family based on age-based averages" Dr. Beim said. "Most women see 30 as the first big fertility milestone. Then, at 35, doctors inform them that they have entered advanced maternal age where the chances of having a baby with a genetic abnormality are significantly increased. And by 40, they are told that they are much less likely to be able to conceive a viable pregnancy on their own."

Game over, right? Wrong, says Dr. Beim. Or, at least, not necessarily. "These numbers are true in the aggregate, but on an individual level, we know that the distributions around these average age milestones are actually pretty broad. Some women may already be experiencing fertility risk at a much younger age, and some may be able to relax about their fertility potential until their mid-40s. We want to empower women to make these often career- and life-defining decisions based on their personal biology rather than on averages. And if they have a risk factor at a young age, we want them to be able to proactively manage their fertility through options like egg freezing, for example."

The company's first product, Polaris, was unveiled in 2014. Named after the always-guiding North Star, Polaris uses "Big Data" collected from reproductive centers throughout the United States. Using Polaris, doctors are able to give

individuals who are currently struggling to have a baby more clarity on what fertility treatments are likely to work for them based on what worked for other couples with similar clinical metrics. And soon, they will expand the platform to also include the world's first genetic diagnostic test for infertility.

When Crain's Says "Watch," People Watch

In 2014, five years after the company was founded and one year after listing Dr. Beim in its annual 40 Under 40, Crain's New York Business named Celmatix one of its Six Biotech Startups to Watch.

"What we have today is a strong proof point on the way to our ultimate vision," says the CEO. "We see the dramatic effect that access to personalized information is having on patients who are experiencing fertility difficulties. But our ultimate goal is to give women access to this information even earlier in their lives, when they have more options and time to plan."

"Access to proactive fertility management tools will solve a huge unmet need," said Dr. Beim. "This is what draws investors, employees and partners to Celmatix."

Topspin Partners has led Celmatix's capitalization, and the company has raised \$13.5 million to date. Celmatix is now gearing up to announce when they will release their genetic test. Six years in the making, Celmatix is developing a non-invasive genetic diagnostic test that will arm doctors with valuable insights before treatment begins. These insights could help patients save time and money on the path to getting pregnant.

So, What Happens When All Signs Point to "No?"

When Dr. Beim and Celmatix co-founder Laura Towart Bandak started the company in Ms. Bandak's TriBeCa apartment back in 2009, they were focused on solving what they knew was an enormous worldwide problem: infertility. Turns out, the problem was even bigger than they first realized.

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The current infertility market is estimated to be around \$3.5 billion. By 2018, market data predicts, the worldwide spend by couples who are trying to get pregnant will be \$4 billion. Many will conceive but, sadly, many more won't.

Countless couples have conceived through the wonders of in-vitro fertilization (IVF). However, the process can be stressful and expensive. Once they know the statistical chances associated with IVF (up until now always based on average ages and averaged outcomes), many couples walk away before they even start.

For those couples that do decide to go through IVF, Celmatix has now proven with its aggregate Big Data collection that a typical woman's cumulative chances of getting pregnant continue to increase even after several rounds of failed treatment. "Our data suggests that one in every four patients, who start IVF treatment, quit before they have maximized their chances of getting pregnant. Furthermore, we predict that if every patient who discontinued treatment had just done one additional month of IVF, 40% of them would have had a baby," Dr. Beim stated.

Couples stop IVF for many reasons: stress; marital strain; and, yes, cost is definitely a factor. However, the company has learned it's not the main reason couples stop IVF treatments. In fact, more than anything else, couples quit before conceiving because of "lack of clarity about where this is going."

This is the critical pain point Dr. Beim and the team of dedicated scientists at Celmatix want to solve. So, as its name suggests, Polaris led Celmatix to create a new digital health product: Nova takes the process one step further by improving patient experience for couples who are currently struggling to have a baby.

When a couple visits a fertility center equipped with Nova, the doctor is able to collect all relevant data through an easy-to-use and quick online portal. Essentially, according to Celmatix, Nova is a "patient concierge" that enables clinics to provide a better experience for couples beginning their fertility treatment journey.

Together, Nova and Polaris provide the answer. Now couples will have a personalized road map that plots their fertility journey. Instead of being overwhelmed with dozens of time-consuming forms and overwhelming questions they don't have the answers to, fertility doctors can use Nova to collect information digitally and then offer real-time predictions about their chances of getting pregnant with fertility treatment.

To that end, Celmatix set out to prove the point more clearly. It collaborated with Reproductive Medicine Associates in New York on a recent study. The records of 6,000 patients who



went through infertility treatments in an effort to conceive were analyzed.

What they observed, explained Dr. Beim, is that 40% of the women who dropped out after two cycles would have likely gotten pregnant on the next month of treatment had they continued. But, many couples stop trying; they think it's hopeless – even though doctors often say that their chances increase with each cycle of treatment. Using Celmatix's products, couples will have far more than "hope." They will have better clarity based on their personal metrics, Dr. Beim said.

Dr. Alan Copperman, director of the division of reproductive endocrinology at Mount Sinai Medical Center, said it best in a Crain's New York article about Celmatix. "Knowing who is at risk of having problems – that's the game changer," he said.

"We've been told that the Celmatix story gets more exciting the more you know about it," Dr. Beim says. "Medicine has always been based on averages." This is true. We wonder: Who will get cancer? Who will have heart disease? How old is too old to have a baby?

"Every person's DNA sequence is unique," Dr. Beim concluded. "So, we should be basing important life decisions on each person's unique data – not on averages." ■

But Wait! There's More!

Celmatix founder and CEO Piraye Yurttas Beim, Ph.D. says her personalized medicine company aims to continue expanding product offerings related to women's health.

"Women encounter many decision points related to their fertility, including decisions around menopause, that could be informed and aided by personalized medicine," she said. "As the only personalized medicine company uniquely focused on women's health, Celmatix is poised to define and lead this exciting new revolution in empowering women with their personal biological data."

