

# **Custom weight-based safety system to protect embryos and eggs against cryogenic storage failure**

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Credit: PRNewsfoto/Columbia University Fertility Clinic

Earlier this year, more than 4,000 eggs and embryos were inadvertently lost as a result of cryogenic tank failures at two fertility centers. Today, Columbia University Fertility Center announced it has developed and built the first weight-based scale safety system to protect stored eggs and embryos in response to these reported failures. Through its custom, web-enabled safety system, Columbia University Fertility can now continuously monitor the real-time weights of its storage tanks and can detect impending tank failures sooner. As a result, it reduces the risk of any damage to embryos and eggs by greatly increasing the time available to intervene should an issue arise. Columbia University Fertility Center is the first and only fertility center to offer this additional layer of protection in its clinic.

Most fertility clinics utilize a blend of manual and automated monitoring systems for cryogenic storage, which rely mainly on increased temperature, or warmth, as the main indicator of tank [failure](#). When temperature rises, it will typically sound an alarm and alert the clinic's staff. The challenge is once the alarm is sounded most of the liquid nitrogen (LN2) has already depleted, leaving little time to take preventative action to save the [embryos](#) and [eggs](#). The goal of the new [system](#) is to provide a redundancy and early-warning system to safeguard the stored eggs and embryos.

"With our weight-based monitoring system, we can detect a problem with a storage tank before temperatures even start to rise, in some cases over a month in advance, providing an earlier warning and greatly increased time to proactively remedy the situation without the eggs or embryos being affected," said Zev Williams, M.D., Ph.D., Director of Columbia University Fertility Center. Dr. Williams adds, "Our goal is to

make another tank failure as impossible as possible. Cryogenic storage is safe and failures are very rare. But, when dealing with something as precious as an egg or embryo, even a single tank failure is one too many."

The weight-based system is able to detect any abnormalities in either the amount of nitrogen in the tank or the rate of nitrogen evaporation from the tank and that can detect impending tank failures before they occur. A typical storage [tank](#) holds between 22-100 L of liquid nitrogen that maintains a temperature of -196 °C. Thus, loss of even just 10 percent of the total liquid nitrogen results in a decrease weight of 1.8-8 kilograms which is readily detectable using specialized scales that can measure changes of just a few hundred grams.

"Every day, individuals and couples come to us with the hope of having a healthy baby in the near or distant future. Some are struggling with infertility while others may be freezing eggs or embryos due to illnesses, like cancer. Other women may be freezing their eggs to preserve a chance for pregnancy in future. In all cases, these eggs and embryos are their future and we are entrusted with this great responsibility," said Eric Forman, M.D., H.C.L.D., Medical and Lab Director at Columbia University Fertility Center. Dr. Forman adds, "The possibility that something could go wrong with frozen eggs and embryos is a lab director's worst nightmare and sometimes keeps me up at night. We cannot have too many safeguards to secure these tanks. This novel weight-based system is an example of how Columbia University Fertility Center is laser-focused on constantly improving the care for our patients."

Today, Columbia University Fertility is employing its innovative, custom-built system using weight-based scales to provide real-time monitoring of embryos and eggs. This system works hand-in-hand with the Center's manual and automated protocols, including temperature, as an added

safety measure.

Provided by Columbia University

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