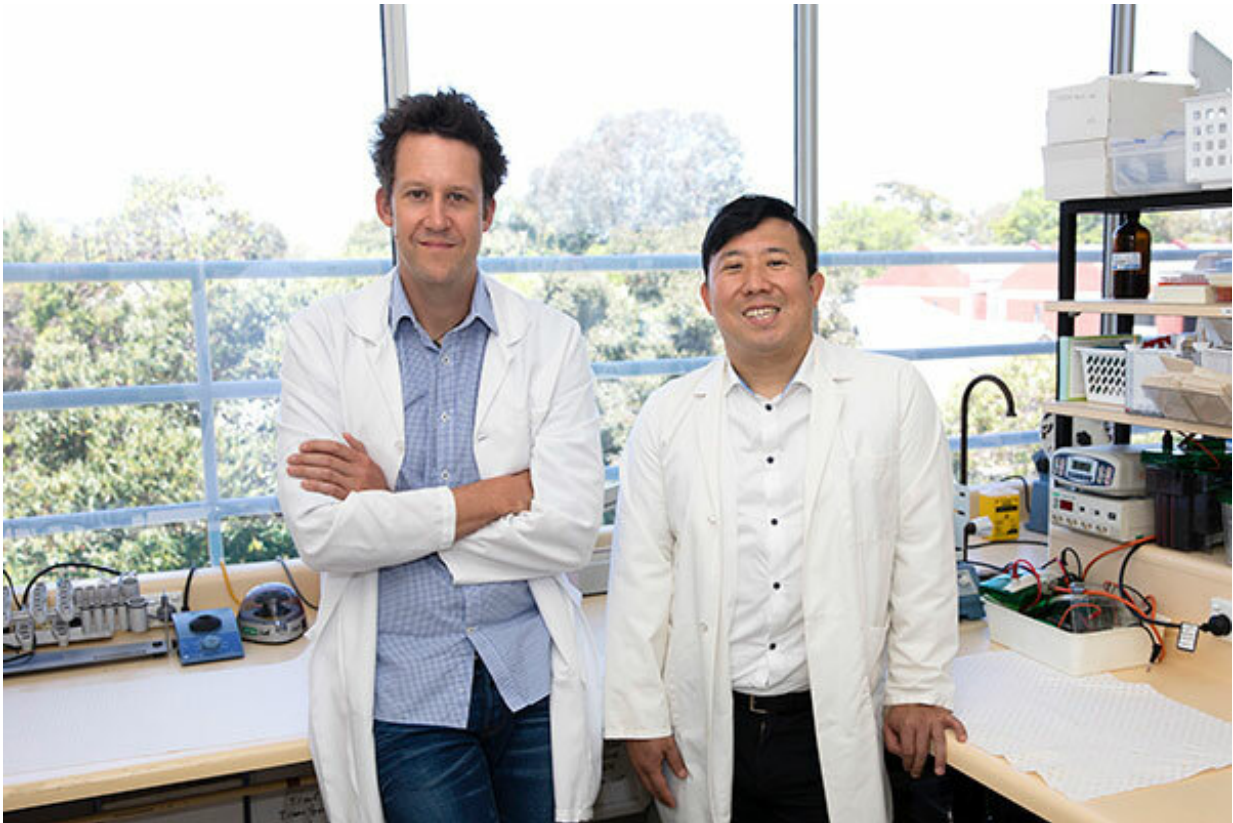


# Artificial womb technology breaks its four minute mile

March 27 2019

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Researchers Matt Kemp and Haruo Usuda. Credit: Women & Infants Research Foundation

A major advancement in pioneering technology based around the use of an artificial womb to save extremely premature babies is being hailed as

a medical and biotechnological breakthrough. Recently published in the *American Journal of Obstetrics & Gynecology*, the study presents world-first data demonstrating the ability of an artificial placenta-based life support platform to maintain extremely preterm lamb fetuses (600 to 700g); equivalent to a human fetus at 24 weeks of gestation.

Head of WIRF's Perinatal Research Laboratories, Associate Professor Matt Kemp, said that whilst previous research had demonstrated the feasibility of extended survival with artificial placenta technology in late preterm fetuses, there was no published evidence that demonstrated the use of the platform to support extremely preterm fetuses—the eventual clinical target of this technology.

"For several decades there has been little improvement in outcomes of extremely [preterm infants](#) born at the border of viability (21-24 weeks gestation)," Assoc Prof Kemp said. "In the AJOG study, we have proven the use of this technology to support, for the first time, extremely preterm lambs equivalent to 24 weeks of human gestation in a stable, growth-normal state for five days. This result underscores the potential clinical application of this technology for extremely preterm infants born at the border of viability. In the world of artificial placenta technology, we have effectively broken the 4 minute mile."

Kemp said the latest findings represent a significant milestone in the technology's future implementation into clinical use. "If we are to improve outcomes for babies born at the border of viability we must recognise that they are not 'small babies'; rather, they are a unique patient demographic that, due to their extremely underdeveloped lungs and limited cardiovascular capacity, require an entirely different treatment approach from older [preterm](#) infants. The technology was designed to revolutionise the treatment of severely premature newborns. The goal is to offer a bridge between a natural womb and the outside world to give babies born at the earliest gestational ages more time for

their fragile lungs to mature. With additional refinement, what today might be considered as futuristic technology might soon not be so futuristic and might be standard of care."

**More information:** Haruo Usuda et al, Successful use of an artificial placenta to support extremely preterm ovine fetuses at the border of viability, *American Journal of Obstetrics and Gynecology* (2019). [DOI: 10.1016/j.ajog.2019.03.001](https://doi.org/10.1016/j.ajog.2019.03.001)

Provided by Tohoku University

Citation: Artificial womb technology breaks its four minute mile (2019, March 27) retrieved 20 April 2024 from <https://medicalxpress.com/news/2019-03-artificial-womb-technology-minute-mile.html>

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