

ARTIFICIAL WOMB FOR PREMIES?

By Erika Engelhaupt

One day in the not-too-distant future, the nervous parents of a premature baby might find themselves peering into something a bit like an aquarium. Inside an artificial womb, a preemie would be submerged in simulated amniotic fluid, which would fill the lungs and give them time to develop the ability to breathe air.

A typical human pregnancy lasts about 40 weeks, and babies are considered premature at 37 weeks. Each year about 15 million babies worldwide are born prematurely—more than one-tenth of all births. The very youngest considered viable—just 22 to 23 weeks old—typically weigh only about a pound and have less than a 50 percent chance of survival. One of the main reasons they die is that their lungs are too fragile to breathe air.

In April researchers at Children's Hospital of Philadelphia reported in *Nature Communications* that they had tested an artificial womb on eight premature lambs, chosen because lambs' lungs develop similarly to those of humans. Each lamb grew in a bag filled with artificial amniotic fluid, and the beating of its heart pumped blood through its umbilical cord into a machine that acted like a placenta, adding oxygen and removing carbon dioxide.

The team reports that the lambs' lungs and other organs developed as though they were in a real sheep's womb, an



important improvement over methods used to keep preemies alive today. A few of the lambs have since grown to adulthood, and one is now more than a year old and appears normal in every way, including in its brain development.

"We don't have an intelligence test for lambs," study leader Alan Flake said at a news conference, "but we think they're pretty smart lambs."

The goal of artificial wombs, Flake says, is not to grow babies entirely outside their mothers or even to extend the limits of viability to earlier ages. Instead researchers hope for better survival and health for babies born before the critical 28-week age when their lungs are ready to take that first breath.

During the 28 days that a premature lamb grew in an artificial womb, it was able to move, open its eyes, and grow wool.



A BETTER TEST FOR EBOLA

The Ebola virus killed more than 11,000 people in West Africa after a 2014 outbreak. Since then biochemist Mehmet Yigit, of the University at Albany, in New York, has devised a new, low-cost test that detects biomarkers of the contagious disease in urine. A sample that turns red after testing means infection. Purple means all clear. Other tests take days to yield results; Yigit's can reveal Ebola indicators within hours. —Catherine Zuckerman

PHOTOS: NATURE COMMUNICATIONS (LAMB); CARLO DE JESUS, UNIVERSITY AT ALBANY (VIALS)

