

AquaWomb

Towards a liquid-based perinatal life support (PLS) system for extremely premature infants



Positive Impact

Improved health outcomes for extreme preterm born infants
Reduction of (in)direct healthcare costs and societal costs



Initial Validation

Prior work is 10+ years research, and most recently a European FET Open program with a consortium of universities Eindhoven, Milan, Aachen. This reached a maturity level of TRL4 (feasibility in a lab environment).



Solution

Our solution is to continue child development more natural and to use their own umbilical cord – now connected to an artificial placenta – to give oxygen and nutrition just like the mother does. And a warm alternative mother womb to protect them for temperature drops, external shocks and infections! This will mature their organs, so they get stronger and get ready for a healthy birth.



Problem

The problem with current intensive care in incubators is that under-developed organs get damaged by too early over-asking. We see 40% mortality in extreme pre-term births (<26 weeks), and high risk for life long health implications for all pre-terms (<37 weeks).



Conventional incubator



Possible design of AquaWomb PLS system



Technology

- Training and simulation of transfer procedure from natural womb to the PLS system
- Connection of umbilical cord to an artificial placenta (oxygenator)
- Prototype of a liquid-filled chamber-in-chamber for prolonged physiological fetal development.
- Monitoring for vital signals and growth with a clinical decision support system
- Value-sensitive design to enable family bonding (e.g. sound, touch, vision)



Call to Action !!!

We are looking for a system architect with a passion for complex medical devices. Experience with the development of complex, invasive and high risk technologies is desired for this role!

If you are interested, please reach out to entrepreneur@hightechxl.com



Potential Markets

We target the global NICU equipment and services market, where forecasts for NICU equipment show a market size of 15 B\$ in 2032.

Current market shows a limited number of NICU equipment vendors (incubators, respiratory-, monitoring- and phototherapy devices) dominating the global market. We expect 3-4 main players to dominate this new market as well.