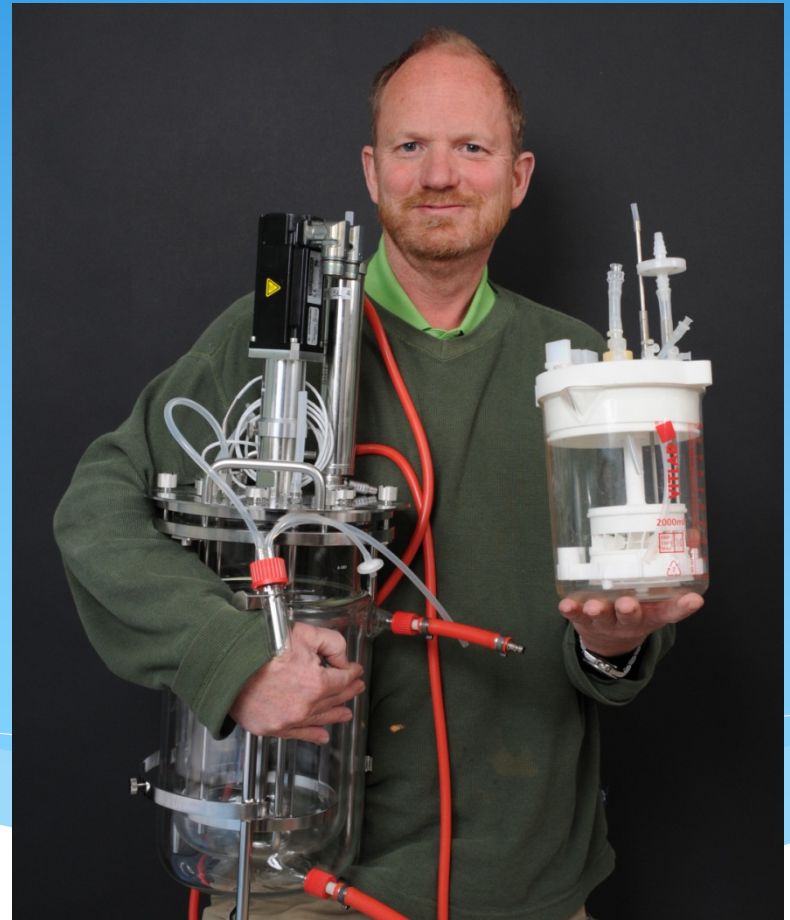


# Functionality of CellTank Single-Use-Bioreactor

How does the CellTank cultivate suspension cell lines in perfusion?

It's easy to understand

1. Typically billions of cells are hosted in one large cavity - the glass/steel Stirred-Tank-Reactor
2. Think opposite - cells hosted in millions of small cavities in a scaffold
3. Then think 500 cells in each cavity
4. It's that simple

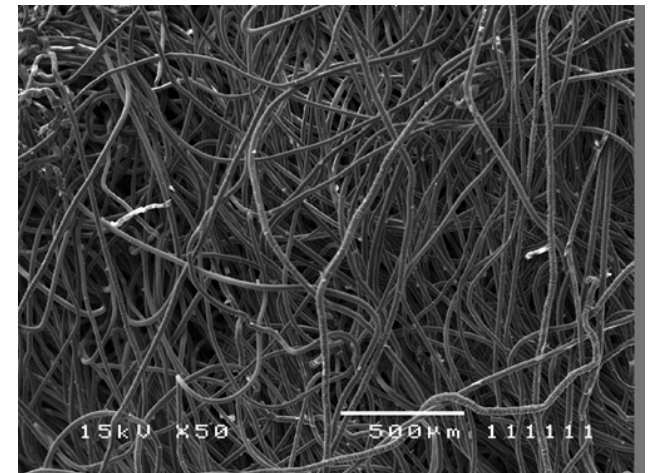


# Scaffold

Perfusion is a method for continuous cultivation preferably in a bioreactor where cells are harbored inside a scaffolding.

The scaffold may be fibers arranged randomly creating millions of cavities such as 100  $\mu\text{m}$  large pores.

Suspension cell lines are captured and stay inside the cavities as to various filtration phenomenon.

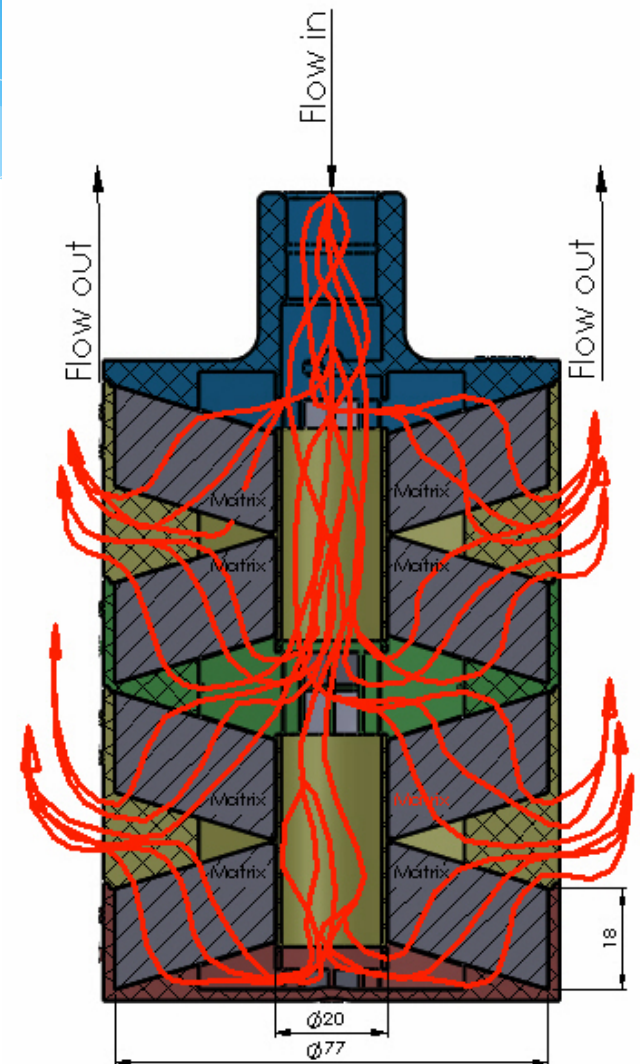


# Gradient free

Perfusion is a method for continuous cultivation preferably in a bioreactor where flow of nutrients are fed to each cell, giving a continuous harvest for an extended period.

The scaffold may also be fibers arranged randomly creating stacked discs with 95% porosity.

Forced media which flow through the packed discs reach all the harboured cells.



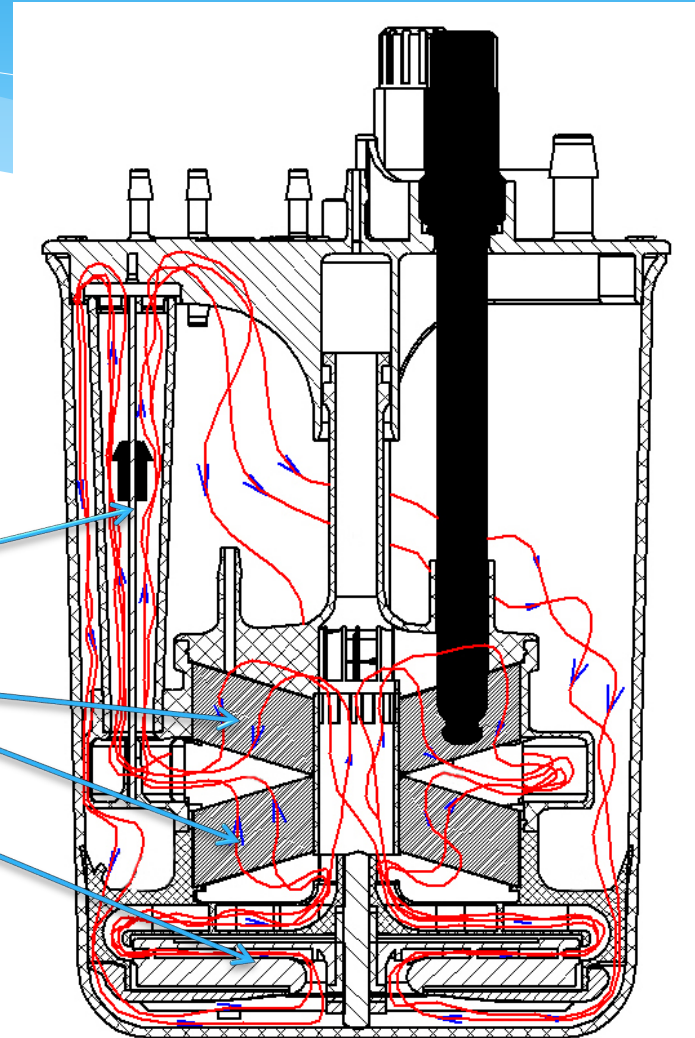
# Re-circulating media

Illustration of constant media re-circulation and flow pattern in CellTank.

Follow blue arrows and red lines to imagine the flow pattern

CellTank facilitates:

- \* a rotameter which measure media flow
- \* two envelopes arranged angled in parallel sharing the media flow
- \* a centrifugal pump for media re-circulation

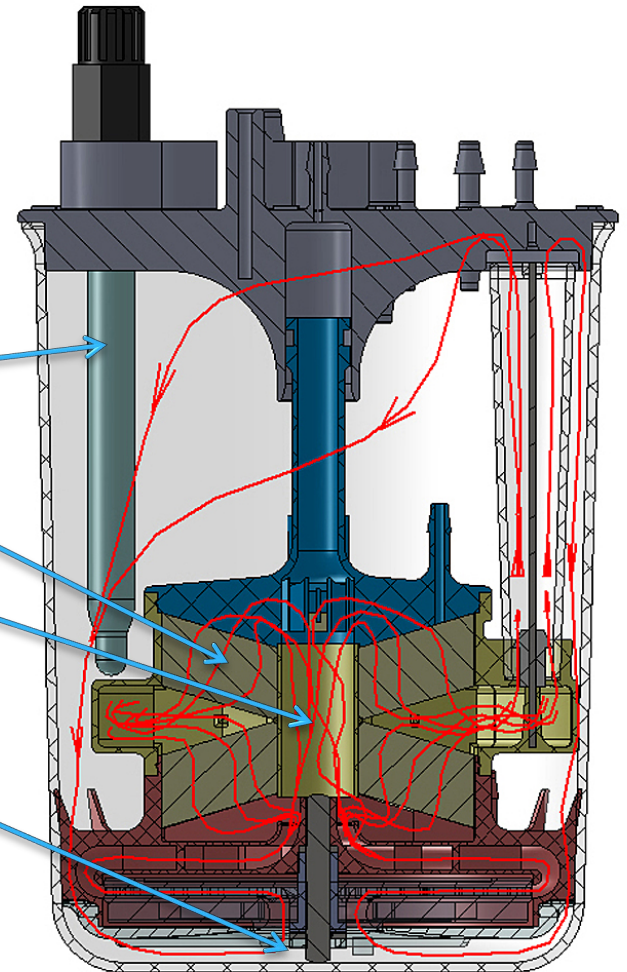


# Media flow

## Illustration of components and flow pattern in CellTank

### Reactor Core facilitates:

- Standard PG13.5x120 mm sensor
- Envelopes filled with porous matrix / scaffold
- Reactor core media distribution centre
- Centrifugal pump inlet





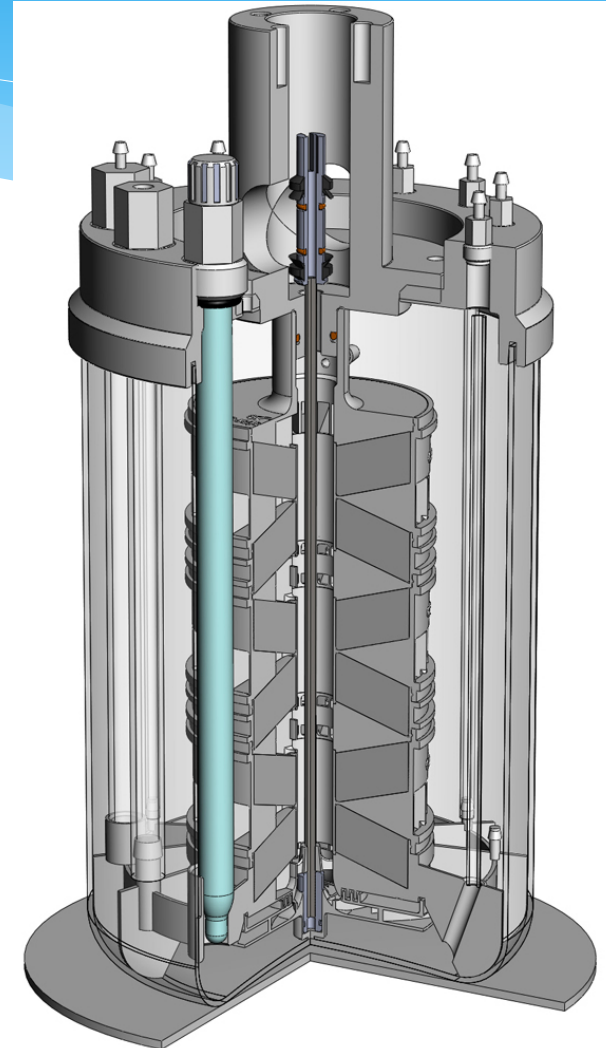
# Scalable platform

The CerCore platform is a perfusion reactor core with envelopes arranged parallel and radial / axial inlet / outlet

CerCore is a cylinder with stacked pairs slightly angled and circular envelopes

As the envelope diameter and pair number are variable the incredible scalability is created

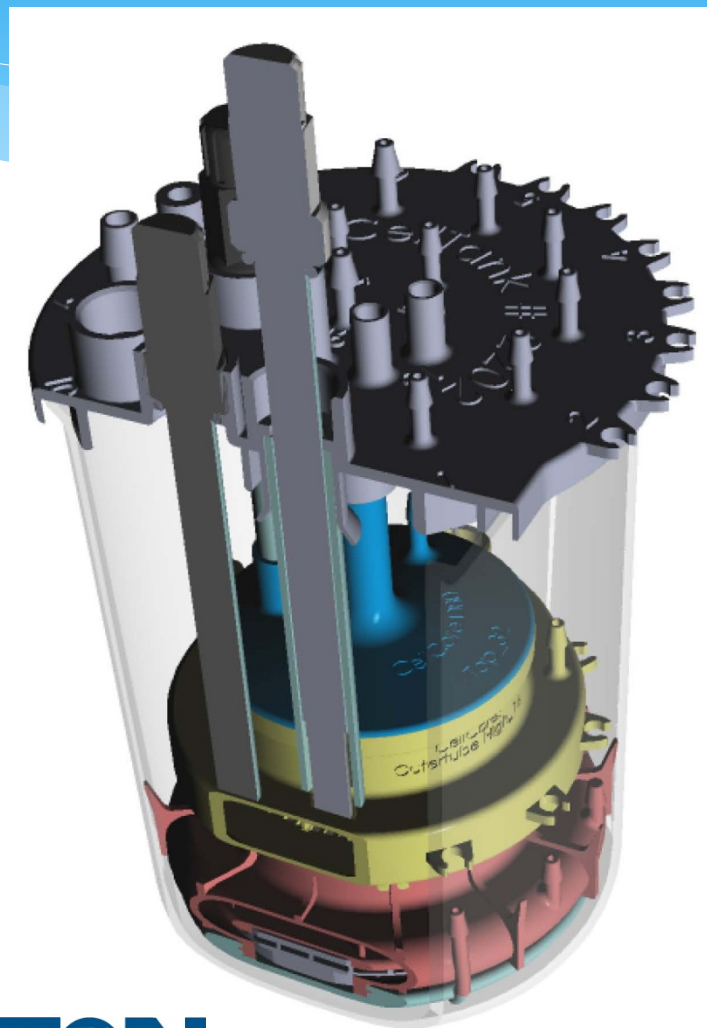
The envelope volume span is from a 15 ml to >15,000 ml



# Sensors

Single-Use-Sensors (SUS) for DO and pH offer the following advantages:

- \* Integrated SUS eliminates contamination risk
- \* Saves hours of prep time and labor, as no autoclaving or cleaning is needed
- \* Enables SUS integrated SUB setup right on the bench – no biosafety cabinet / hood needed for operation
- \* Optical sensing principle integrated in non-invasive well for the re-usable VisiFerm DO classical signal sensor
- \* Extends DO sensor life, as it is never autoclaved
- \* Classical pH sensor for extended lifetime needed for months of perfusion cultivation
- \* Classical pH and DO sensor signal fits any PCS



# Ready to use

## Skip

- \* Cleaning the old fashion glass/steel STR and waiting for the autoclave
- \* Carrying heavy gear as all CellTank are light weight
- \* Worrying about possible contamination
- \* Worrying about damaging your costly jacketed glass vessel
- \* Worrying about heavy investment for increased production capacity





# CellTank in use

**Just one example!**

**The standard Biostat servo motor easily drives a CerCell Magnetic-Stirrer-Table for easy integration of CellTank**

**The photo illustrates CellTank on Biostat in perfusion cultivation which easily last more than a month.**

