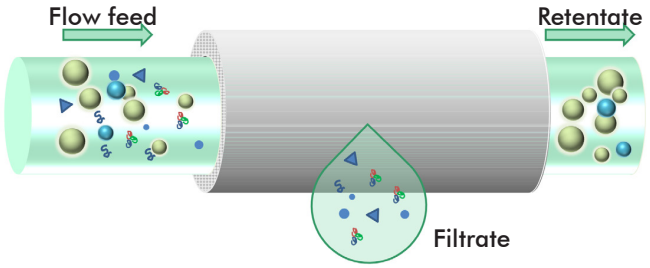
TFF-EVs Small: Tangential Flow Filtration for EV isolation and concentration

About TFF-EVs

TFF-EVs is a filter cartridge containing polyethersulfone hollow fibers (50 nm pores), which allows the concentration and the purification of nanoparticles and Extracellular Vesicles (> 50 nm) from different fluids, including conditioned media, human biofluids and plant extracts. Water and small molecules (< 250 kDa) pass through the hollow fiber pores, whereas nanoparticles are concentrated in the retentate.



Technical features

1	Sample injection nozzle	4	filtrate outlet
2	Flow valve	5	Flow valve
3	Filtrate outlet	6	Sample injection nozzle

Technical features	Description
Hollow fiber material	Polyethersulfone
Filtering surface (m2)	0.025
Internal fiber diameter (µm)	210
External fiber diameter (µm)	290
Fiber number per filter	720
Cartridge internal diameter (mm)	11.0
Maximum transmembrane pressure (mmHg)	500
Maximum flow rate (ml/min)	150
Sterilization method	e-beams sterilization

Applications

- Extracellular Vesicles (EVs) and other nanoparticle (viruses, lipidic particles) isolation from conditioned media, biofluids and plant extract.
- Particle buffer exchange, removal of small contaminants (unbound dye molecules).
- Removal of bovine nanoparticles from FBS or FCS for cell culturing.

Video guide

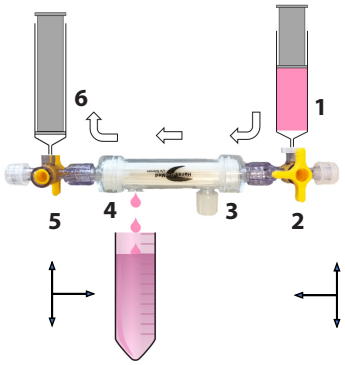
Scann the QR code and watch the user guide for the TFF-EVs Small filter.

Preparation of the fluid before the EV purification

- Sample precleaning.

Fluid	Recommended	Optional
Plasma	10 min at 300 g (save super) 20 min at 1200 g (save super)	30 min at 10000 g to eliminate large particles (> 200 nm)
Serum	10 min at 300 g (save super) 20 min at 1200 g (save super)	30 min at 10000 g to eliminate large particles (> 200 nm)
Urine	10 min at 300 g (save super).	
Cell media*	10 min at 300 g (save super) 20 min at 1200 g (save super).	30 min at 10000 g to eliminate large particles (> 200 nm)

Tangential flow filtration and EV purification, manual use.



- Open the sample injection nozzles 1 and 6.
- Insert the syringe containing the fluid in the injection nozzle 1 and an empty syringes in the injection nozzle 6.
- Open the outlet 4 and place a tube under it to collect the filtrate.
- Rotate the valves 2 and 5 in the position indicated in the figure above.
- Start the filtration process pushing the fluids into the filter from the syringe 1 to the syringe 6. Continue the filtration pushing the syringes 1 and 6 alternatively upwards and downwards until all the fluid is eliminated from the filter.

Particle larger than 50 nm are retained inside the filter fibers.

Particle washing

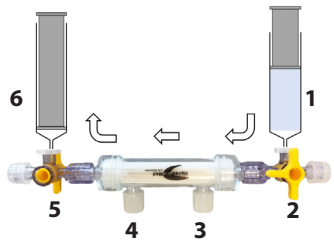
To remove completely the contaminants from the nanopartilces retained into the filter, repeat the same procedure injecting in the syringe 1 PBS 1x buffer (other buffers or solutions can be used as well).

Repeat the washing procedure at least 2 times more.

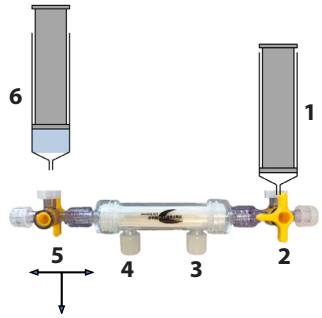
11F., No. 402, Sec. 1, Ren'ai Rd., Linkou Dist., New Taipei City 244014, Taiwan (R.O.C.)
T/ +886-2-26033311 F/ +886-2-26036622 https://www.rocker.com.tw

Particle recovery

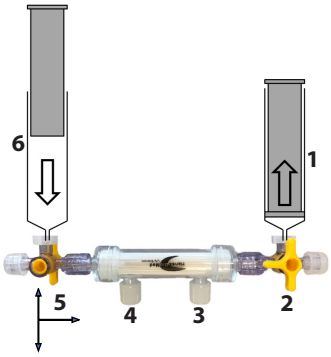
After washing, the particles can be recovered in a small volume of buffer.



- Close the outlets 4 and 3.
- Recover the particles injecting from syringe 1 an small quantity of buffer.
- Rotate the valve 5 in position. 



- Detach the syringe contaning the recovered particles from the nozzle 6 and collect into a clean tube.



- Rotate the valve 5 in the position indicated: 
- Inject air from the syringe 6 in order to recover all the residual volume of buffer containg nanoparticles.
- To maximise the recovery pull up the piston of the syringe 1.

Washing procedure.

Once the filtration process is ended the filter cartridge has to be washed with a NaOH solution 0.5 N, in order to remove contaminants and particles from the hollow fibers. A final wash with aboundant MilliQ water must be performed for removing the chemical traces.

If the cartridge is used for processing complex fluids (serum, plasma) it is recommended to use a NaOH solution 1 N.

If the cartridge is used for processing fluids derived complex biofluids or plant extracts and after the washing steps the fibers look colored or still are present traces of contaminants, a solution of NaClO (0.05%) can be used.

After the washing step containing chemicals (NaOH or NaClO) a final wash with aboundant MilliQ water must be performed for removing the chemical traces.

The filter can be stored at room temperature, dried.

Filter re-sterilization.

The filter can be re-sterilized by Beta or Gamma irradiation. Not suitable for sterilization in autoclave.

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