

Supporting Information

Sieving and clogging in PEG-PEGDA hydrogel membranes

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S1. Characterization of latex particles

The characteristics of carboxylate-modified polystyrene particles of different size are represented in Table S1. The absorption wavelength, the zeta potential and the pH of the solution with a concentration of $2 \times 10^{-4} \text{ g.mL}^{-1}$ does not depend on the particles size.

The size distributions of different latex particles in water is represented in Figure S1. The presence of one pic for each sample signify the monodisperse latex particles with a diameter d of 20, 100 and 1000 nm as represented in Figure S1 a, b and c, respectively.

Table S1. Absorption wavelength, size, zeta potential and pH of feed solutions of latex particles with $C=2 \times 10^{-4} \text{ g.mL}^{-1}$.

Type of particles	Absorption wavelength (nm)	Size (nm)	Zeta potential (mV)	pH of feed solution
a) Latex NP	580	20	-43,4	7,7
b) Latex NP	580	100	-43,4	7,7
c) Latex MP	580	1000	-43,4	7,7

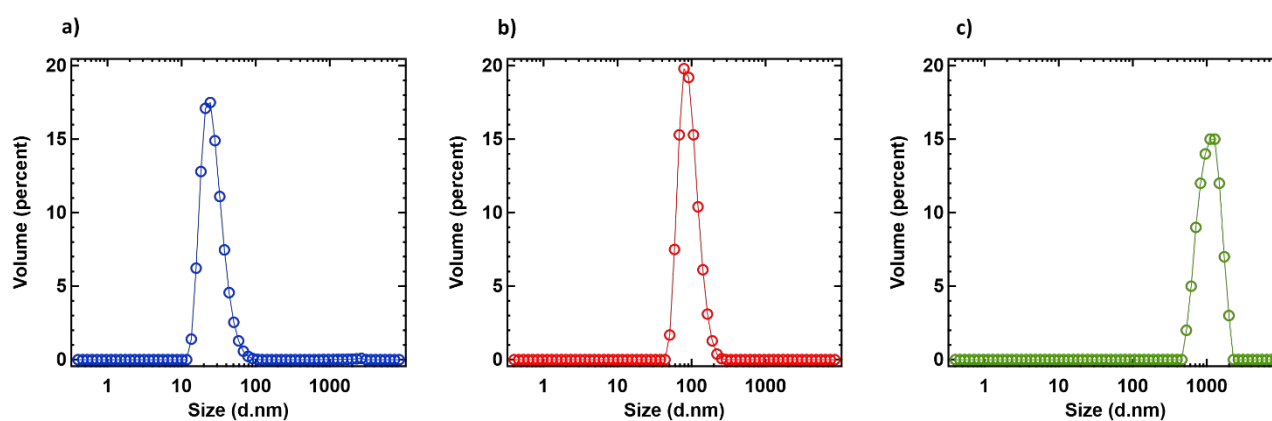


Figure S1. DLS size distributions of different latex particles with a concentration of $2 \times 10^{-4} \text{ g.mL}^{-1}$ in water.

S2. Composition of the PEGDA/PEG samples used in this study

Table S2. Composition of the PEGDA/PEG samples used in this study

m_{PEGDA} (g)	m_{water} (g)	m_{Irgacure} (g)	m_{PEG} (g)	total mass (g)	% wt PEG	% wt PEGDA	% wt water	% wt Irgacure	PEGDA/water ratio
2	10	2×10^{-3}	0.05	12.052	0.4148689	16.594756	82.97378	0.01659476	0.2
2	10	2×10^{-3}	0.2	12.202	1.63907556	16.390755	81.95377	0.01639076	0.2
2	10	2×10^{-3}	0.5	12.502	3.9993601	15.997440	79.987202	0.01599744	0.2

S3. Calibration curves and raw UV/vis data

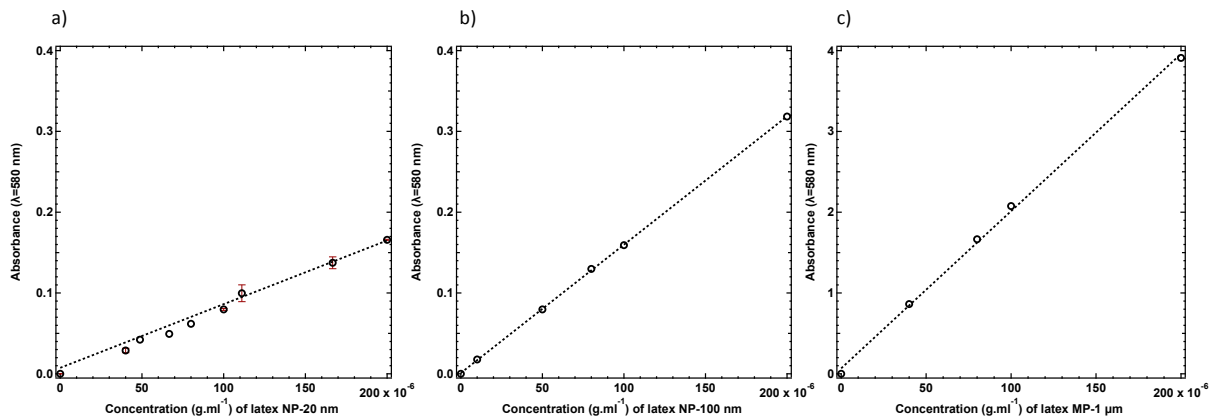


Figure S3-A. Calibration curve of a) nanoparticles of 20 nm (NP-20 nm), b) nanoparticles of 100 nm (NP-100 nm) and c) microparticles of 1 μm (MP-1 μm).

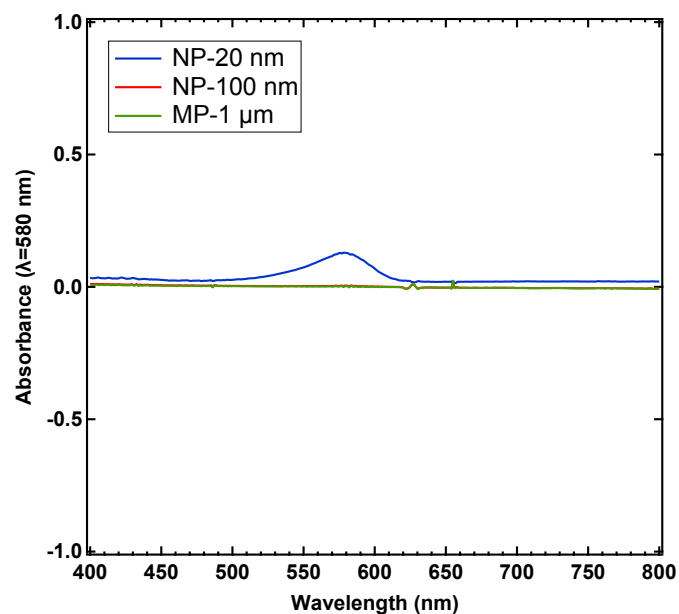
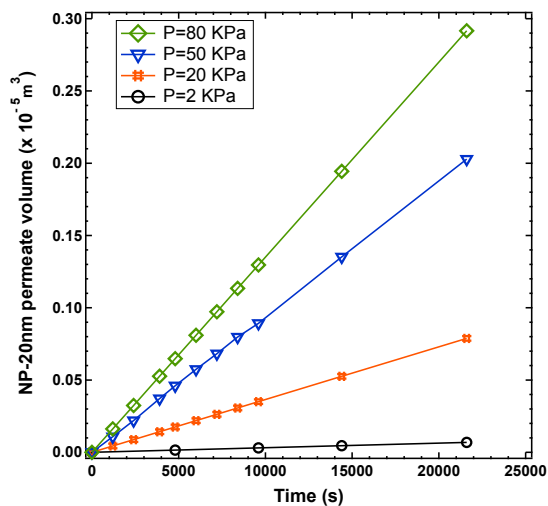


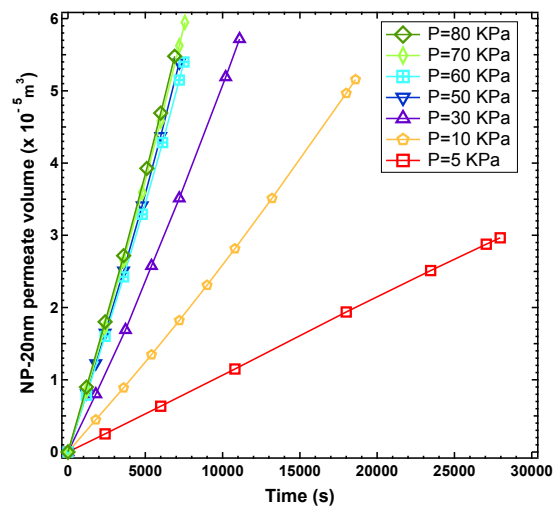
Figure S3-B. Example of UV/visible data obtained for the permeate corresponding to Figure 7. Pressure is $P = 30$ KPa, time = 30 min.

S4. Time evolution of permeate volumes of the nano and microparticles through the PEG/PEGDA hydrogels

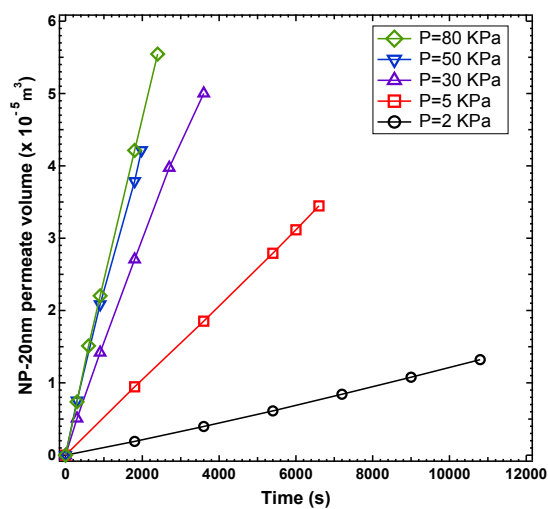
a) 0 wt%_PEG



b) 0.4 wt%_PEG



c) 1.6 wt%_PEG



d) 4 wt%_PEG

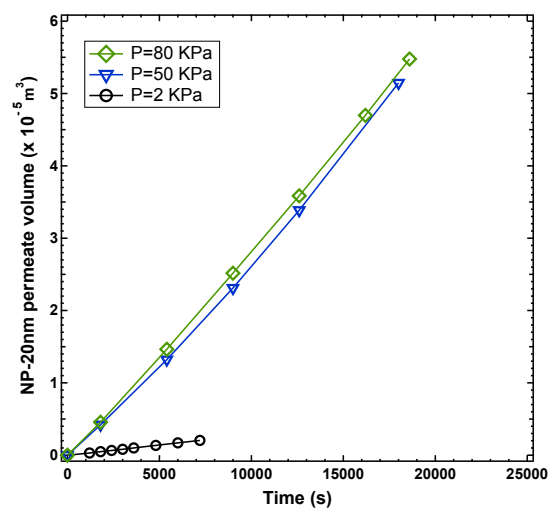


Figure S4-A. Variation of the latex nanoparticles of 20 nm (NP-20 nm) permeate volume as a function of the time under different applied pressures, for hydrogel membrane prepared with PEGDA and a) 0 wt%, b) 0.4 wt%, c) 1.6 wt% and d) 4 wt% of PEG-300 000 g.mol⁻¹.

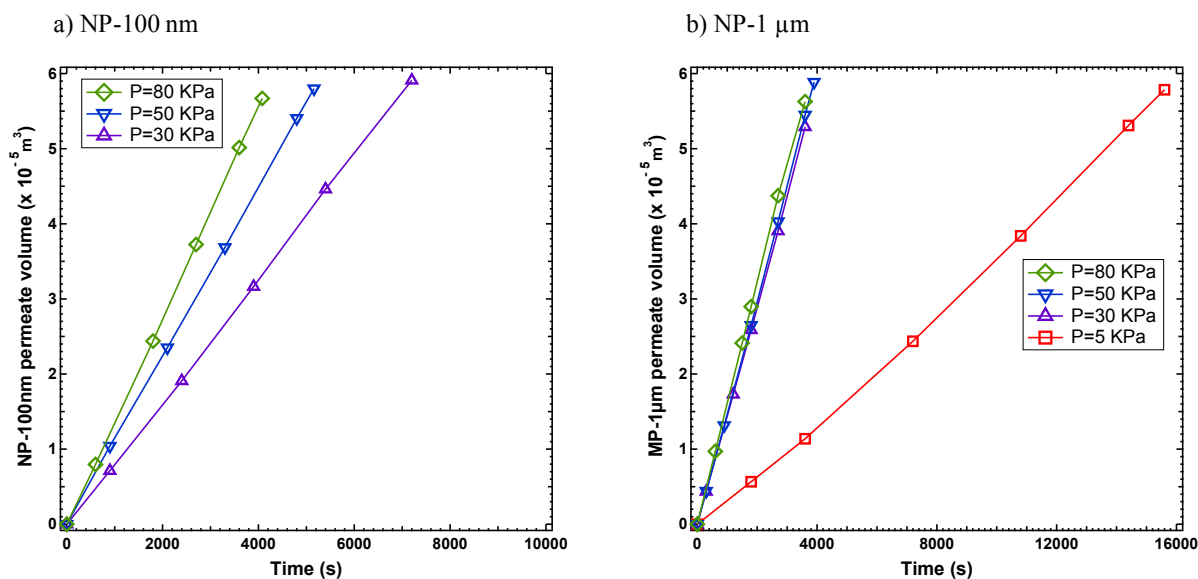


Figure S4-B. Variation of latex a) nanoparticles of 100 nm (NP-100 nm) and b) microparticles of 1 μm (MP-1 μm) permeate volume as a function of time under different applied pressures for hydrogel membranes prepared with PEGDA and 1.6 wt% of PEG-300 000 $\text{g}\cdot\text{mol}^{-1}$.

S5. Cyclic filtration of NP-100 nm and MP-1 μm

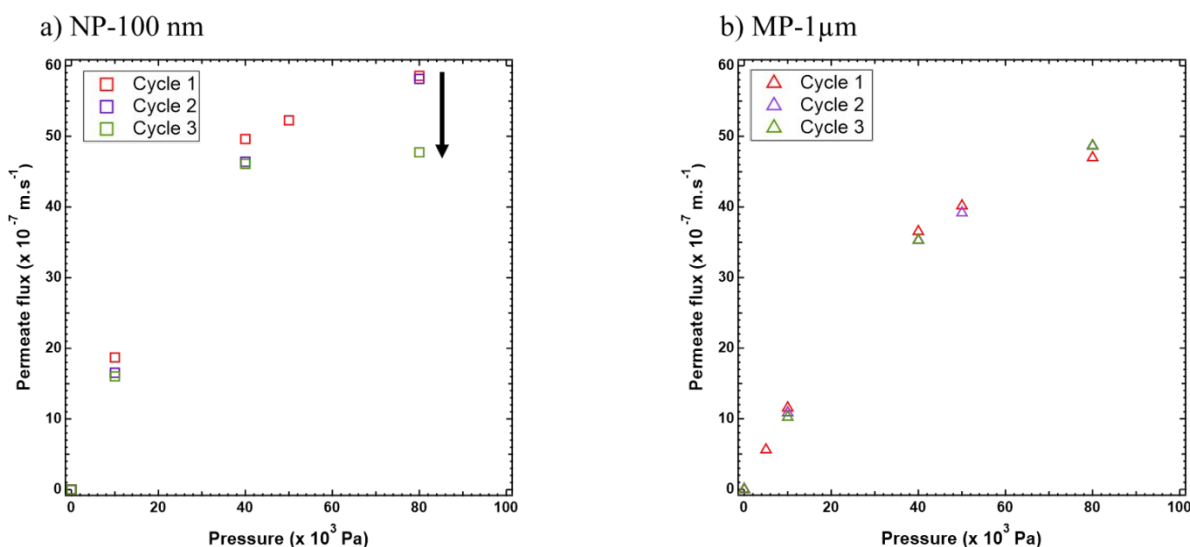


Figure S5. Cyclic filtration of a) nanoparticles of 100 nm (NP-100 nm) and b) microparticles of 1 μm (MP-1 μm) through PEGDA hydrogels prepared with 1.6 wt% of PEG chains.

S6. CryoSEM image

We perform cryoSEM experiments of the 1.6 wt% PEG hydrogels after the filtration of the 1 μm particles to observe the location of the particles in the cavities. As represented Figure S6 a, there is no microparticles present in the cross-section of the hydrogel membrane, as comparison with the NP-100 nm that are trapped inside the hydrogels at the walls of the micron sized cavities

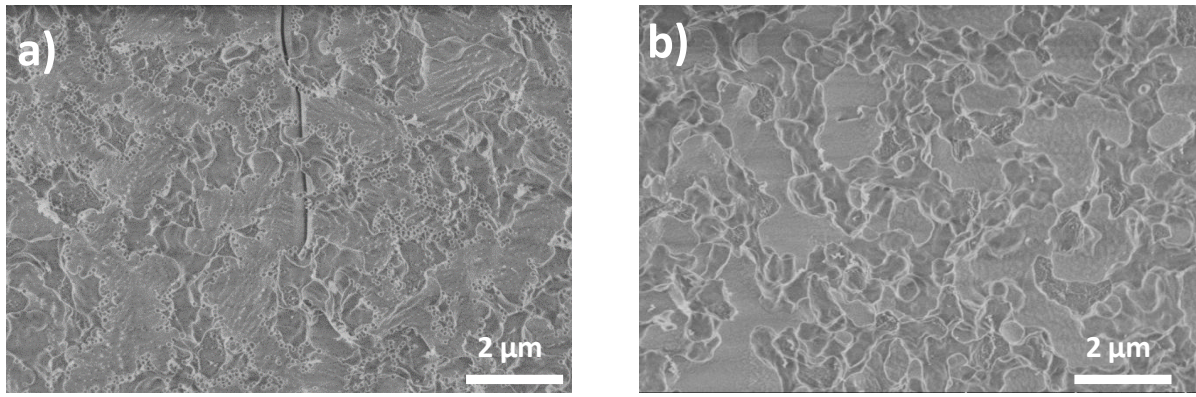


Figure S6. CryoSEM image of the cross-section of a PEGDA/1.6 wt% PEG hydrogel membrane after filtration experiments of a) nanoparticles of 100 nm (NP-100 nm) and b) microparticles of 1 μm (MP-1 μm)