Supplementary information

Separation of extracellular nanovesicles and apoptotic bodies from cancer cell culture broth using tunable microfluidic systems

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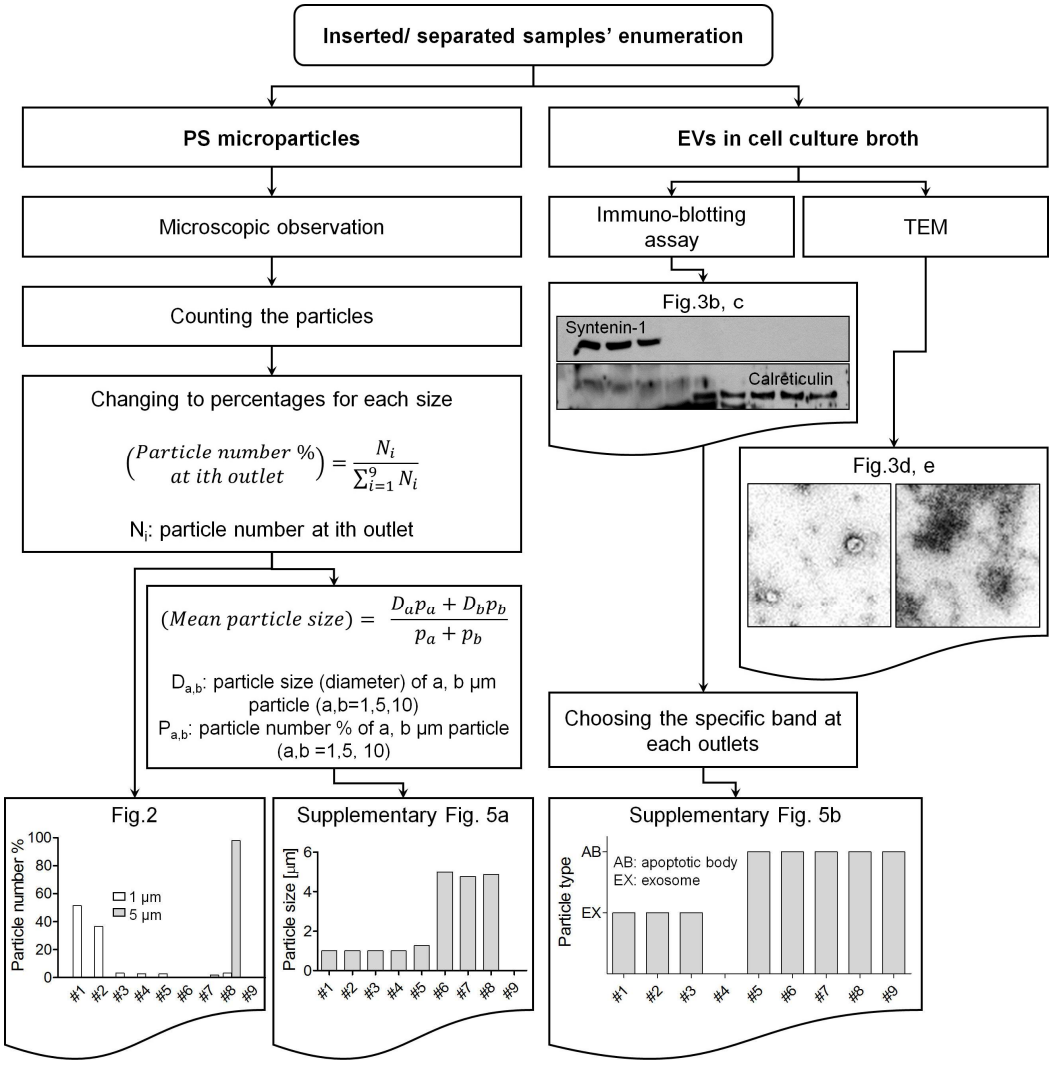
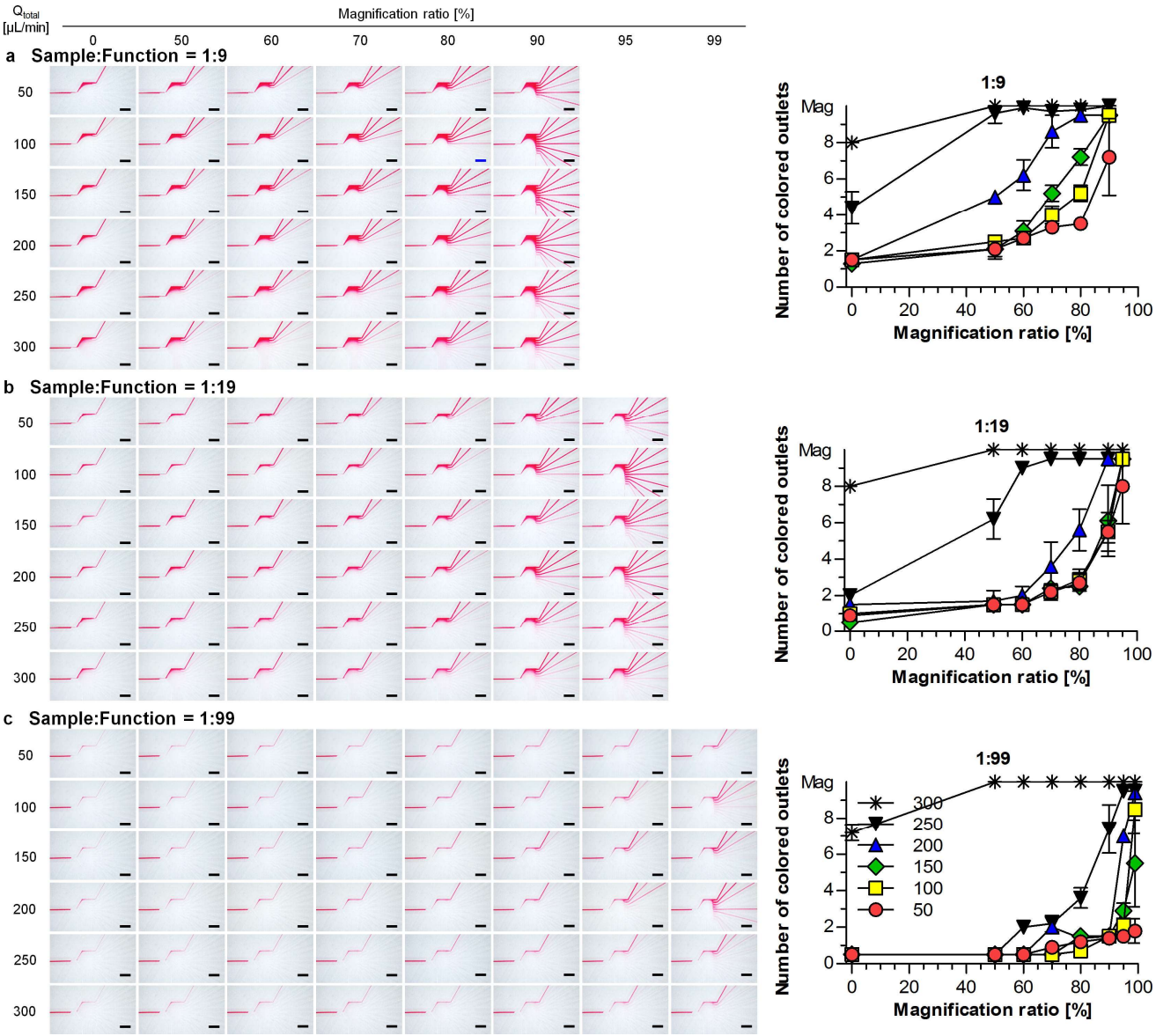
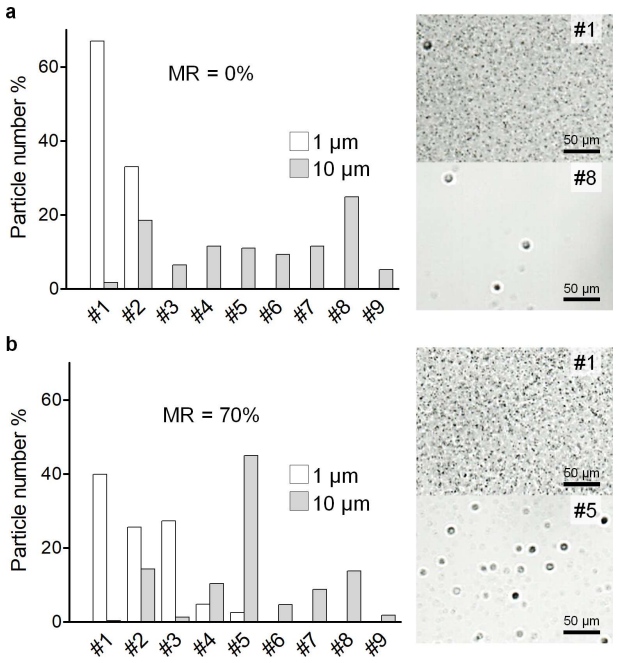


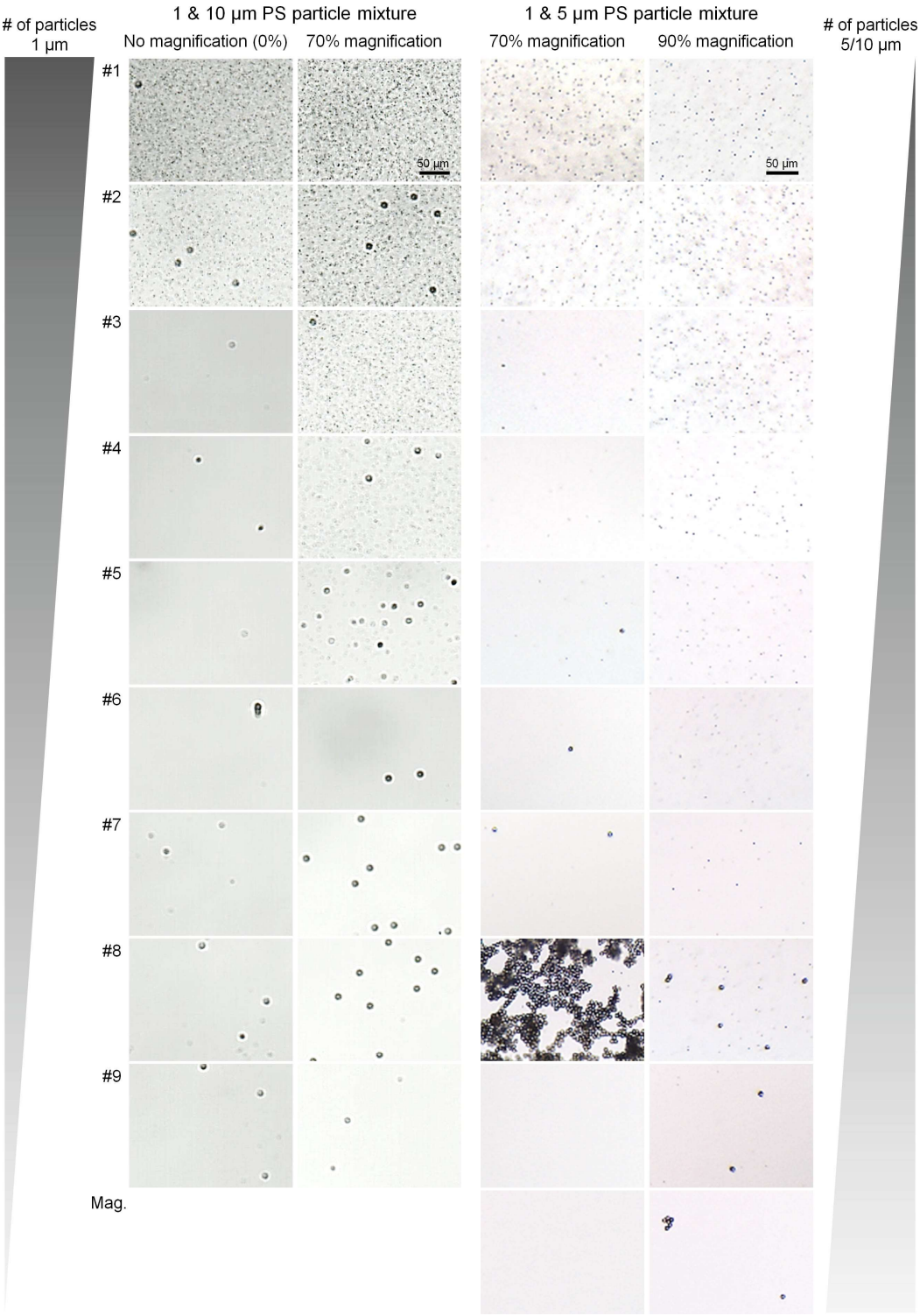
Supplementary Figure S1. Flow chart for data analysis and enumeration of inserted or collected samples.



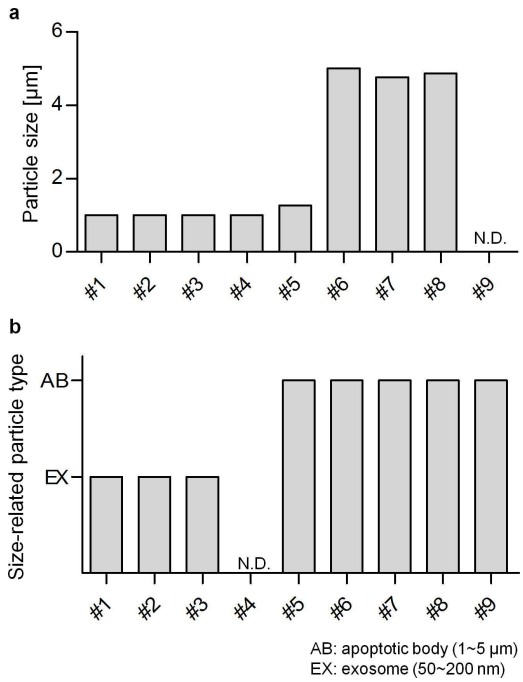
Supplementary Figure S2. Effect of total flow rate (Q_{total}) and magnification ratio (MR) on sample flow expanding is evaluated under the different sample-to-function ratio; (a) 1:9, (b) 1:19, (c) 1:99. Scale bar = 1 cm. Red dye represents sample flow passing through the channel. We count the number of reddish outlet channels and correlated with MR, shown as a graph at the right of the figure. Portion of function fluid increment indicates that less sample is injected; thus, the reddish portion in channel is the highest at (a) and lowest at (c). Stronger withdrawal at a higher MR induces sample flow expansion up to #9 outlet; however, too much withdrawal, similar or higher magnification flow rate than function flow rate, causes loss of sample through magnification channel. Less withdrawal, meaning much lower magnification flow rate than function flow rate, shows lack of expansion of sample flow. Q_{total} > 200 μL/min induces voltex effect; finally the red dye spreads to all channels. The summarized data are displayed as 3-dimensional landscaping graphs in **Fig. 1f**.



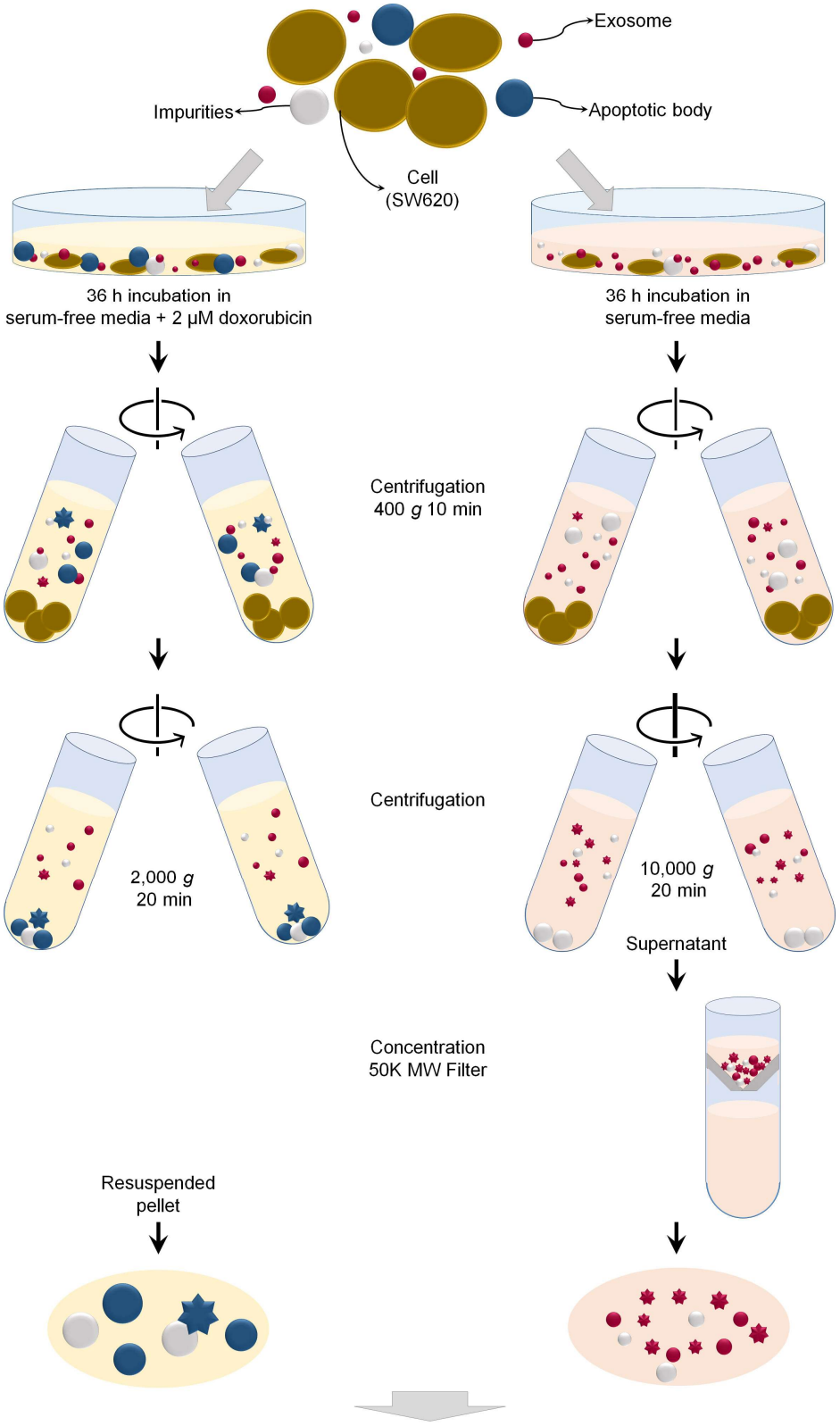
Supplementary Figure S3. PS microparticle sorting tendencies under the different MRs, (a) 0% and (b) 70%, for 1 and 10 μm particle separation. Magnification flow gives overall shift of microparticles toward the higher-number outlets.



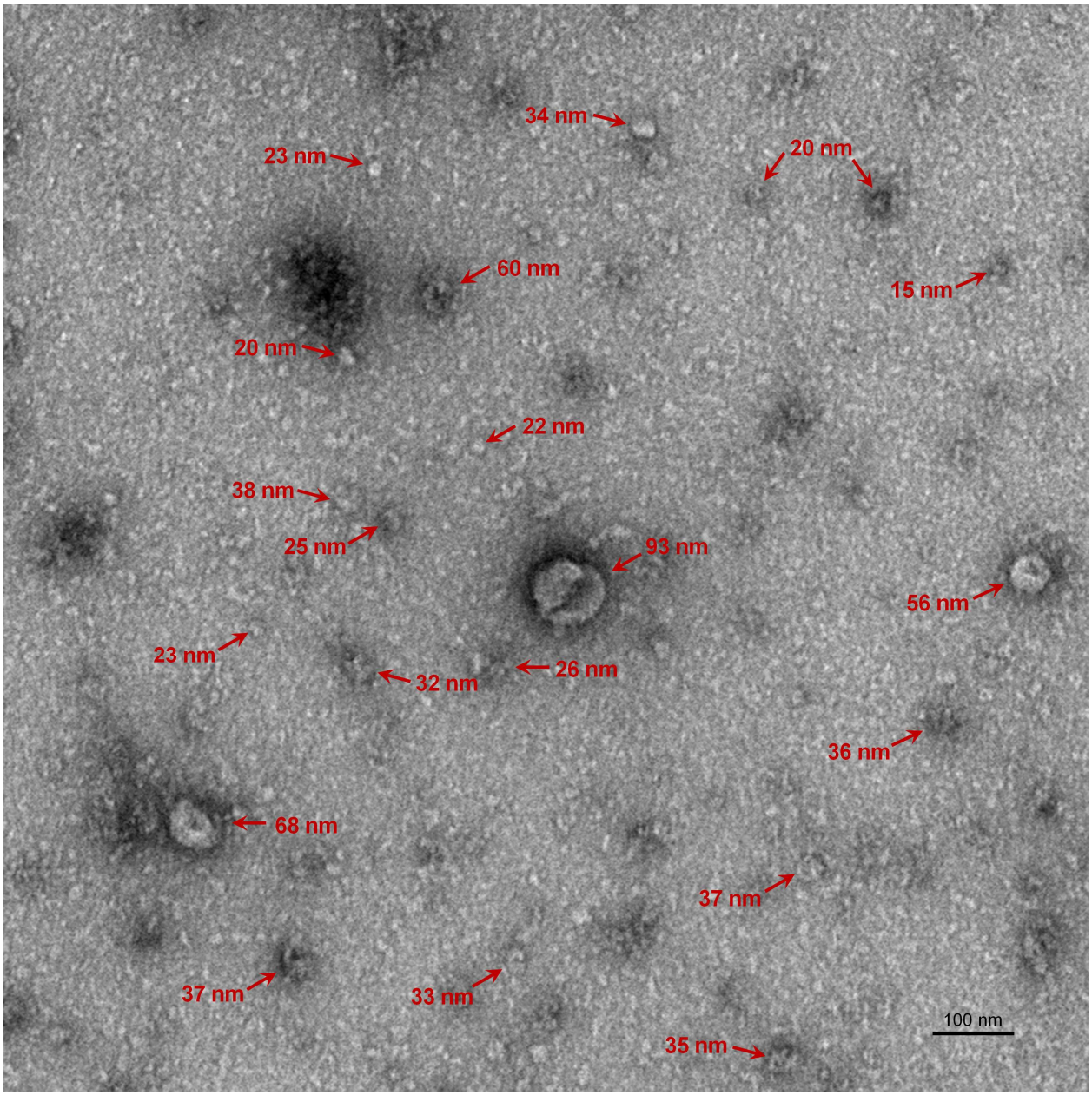
Supplementary Figure S4. Optical microscopic pictures of samples collected in each outlet after PS microparticle separation. These pictures were enumerated quantitatively to the graphs in **Figure 2** and **Supplementary Figure S3**.



Supplementary Figure S5. Comparison of size separation tendencies under different MRs of 70 and 75% in the microfluidic chip. Both rigid PS particles and soft biological vesicles are sorted out by size. The graphs are rearranged from (a) **Fig. 2a**; (b) **Fig. 3b and c**. Detailed replotting procedure is explained in **Supplementary Fig. S1**. N.D. represents 'not detected'.



Supplementary Figure S6. Scheme for extracellular vesicle preparation (not to scale).



Supplementary Figure S7. Enlarged picture of **Fig. 3(d)**.