Electronic Supplementary Material (ESI) for Soft Matter.

Supplementary

Movie 1: High speed imaging (2000 fps) of the formation and growth, one particle at a time, of an aggregate in a pore with W=80µm and Q/Q_c=1.33. Each time a particle is captured by the aggregate its color becomes pale blue.
Movie 2: Further growth of the same aggregate as in movie 1. We skip some capture events during the growth in order to show the evolution of the shape aggregate over a larger time, keeping the frame rate at 2000fps.

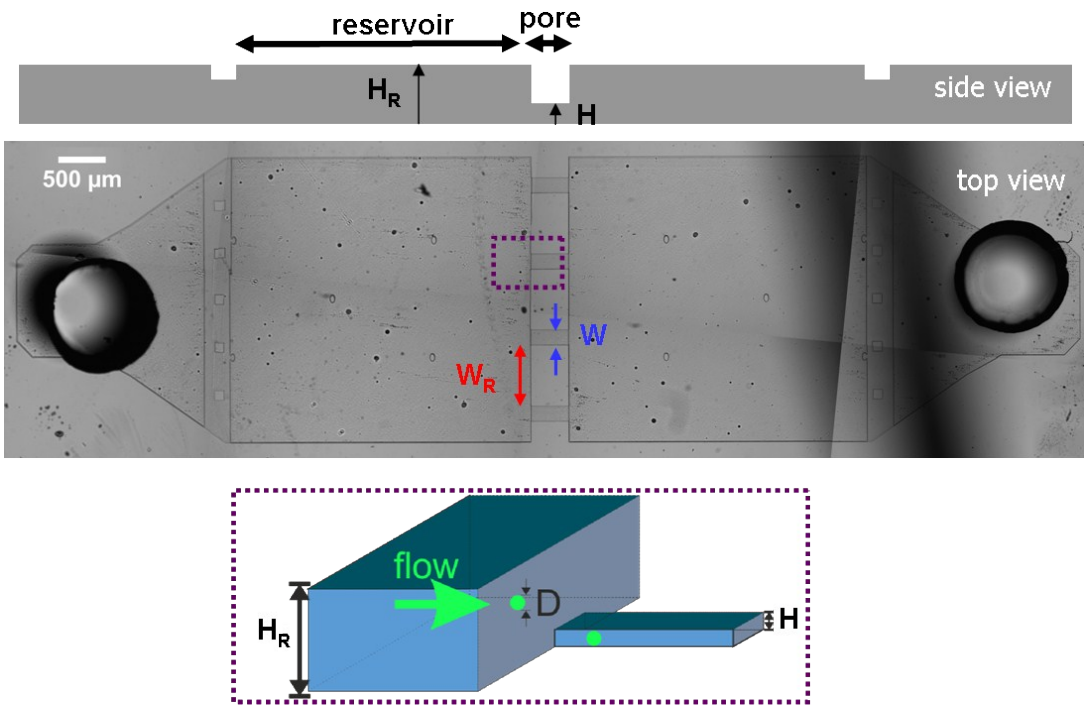

Figure 1: (Top)-Image of the whole microfluidic device with the definition of various geometrical features. (Bottom)-zoom in on the pore entrance zone (bottom). The width of the reservoir zone with a height H_R, or both parts of the central zone, has a width of 3 mm.

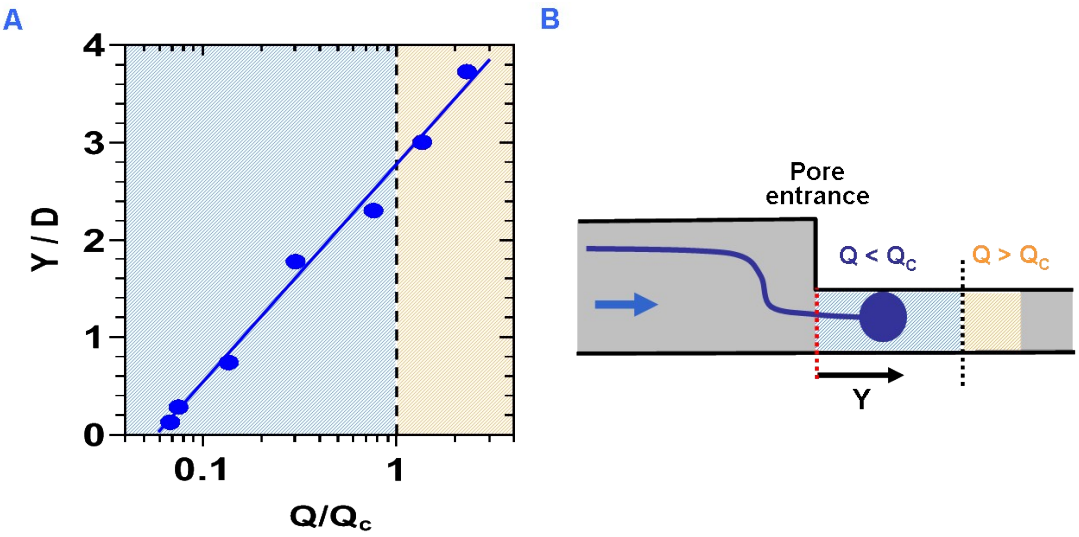

Figure 2: A-Evolution of the average position of the particle deposition from the pore entrance rescaled by *D* for the direct capture mode. The line is a logarithmic fit of the data: $Y/D=\ln(15Q/Q_C+0.09)$. The direct capture mode allows depositing particles only at the pore entrance, within a distance roughly equals to 4*D*. The blue and the yellow hatched zones correspond to $Q<Q_C$ and $Q>Q_C$, respectively. Those zones are also shown in the side view in figure 2B.

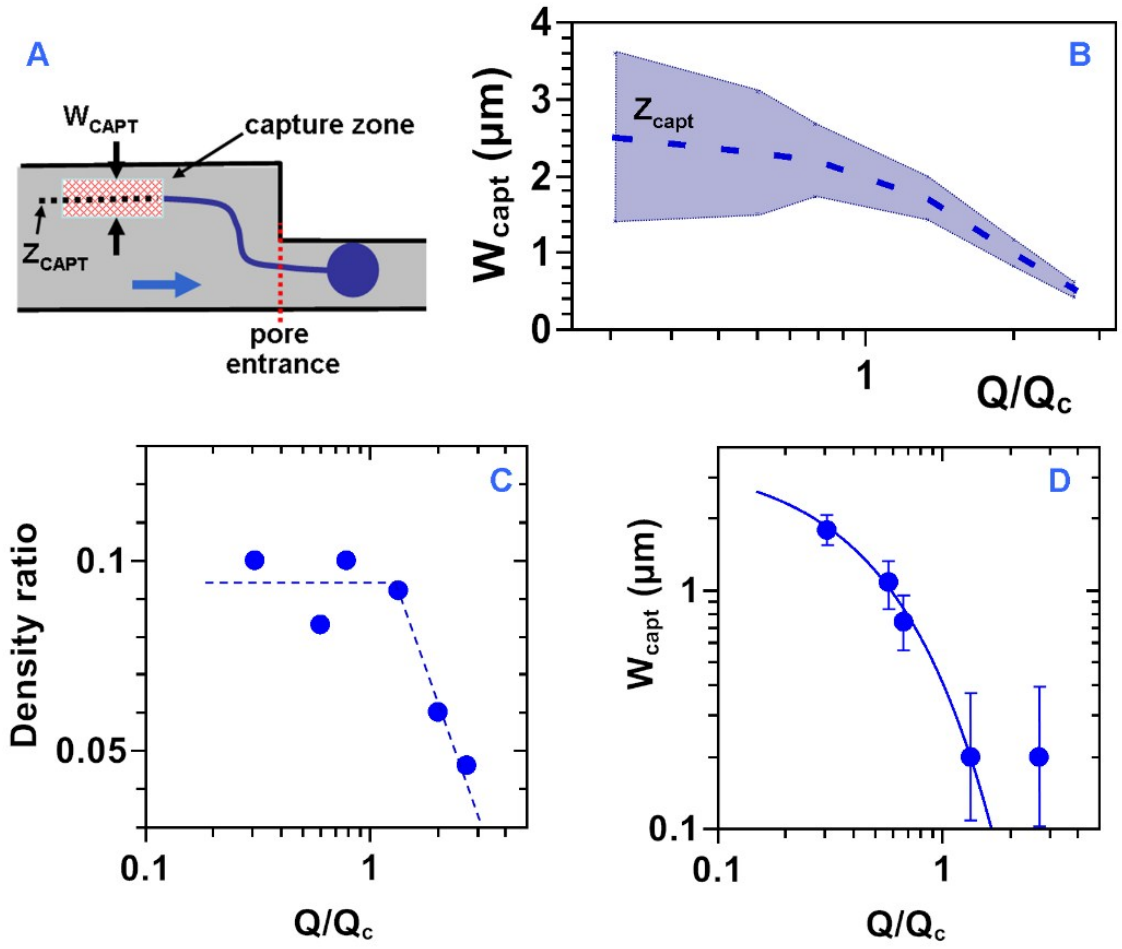

Figure 3: (A)-Definition of the capture zone in the reservoir zone with its width W_{CAPT} and its centre position Z_{CAPT} in a side view of the pore entrance (B)-Variation of Z_{CAPT} (dashed line) and W_{CAPT} (shadowed area), relative to the horizontal top wall, with the rescaled flow rate. (C)-Evolution of the particle density within the capture zone with the rescaled flow rate, which corresponds to the number of particles that flow within W_{CAPT} divided by the total particle number flowing across the channel, N_{CAPT}/N_{TOTAL}. (D)-Variation of W_{CAPT} with the flow rate. The data are the same as those shown on B and the line is an exponential fit: W_{CAPT} =3.6 exp(-2.17Q/Qc).

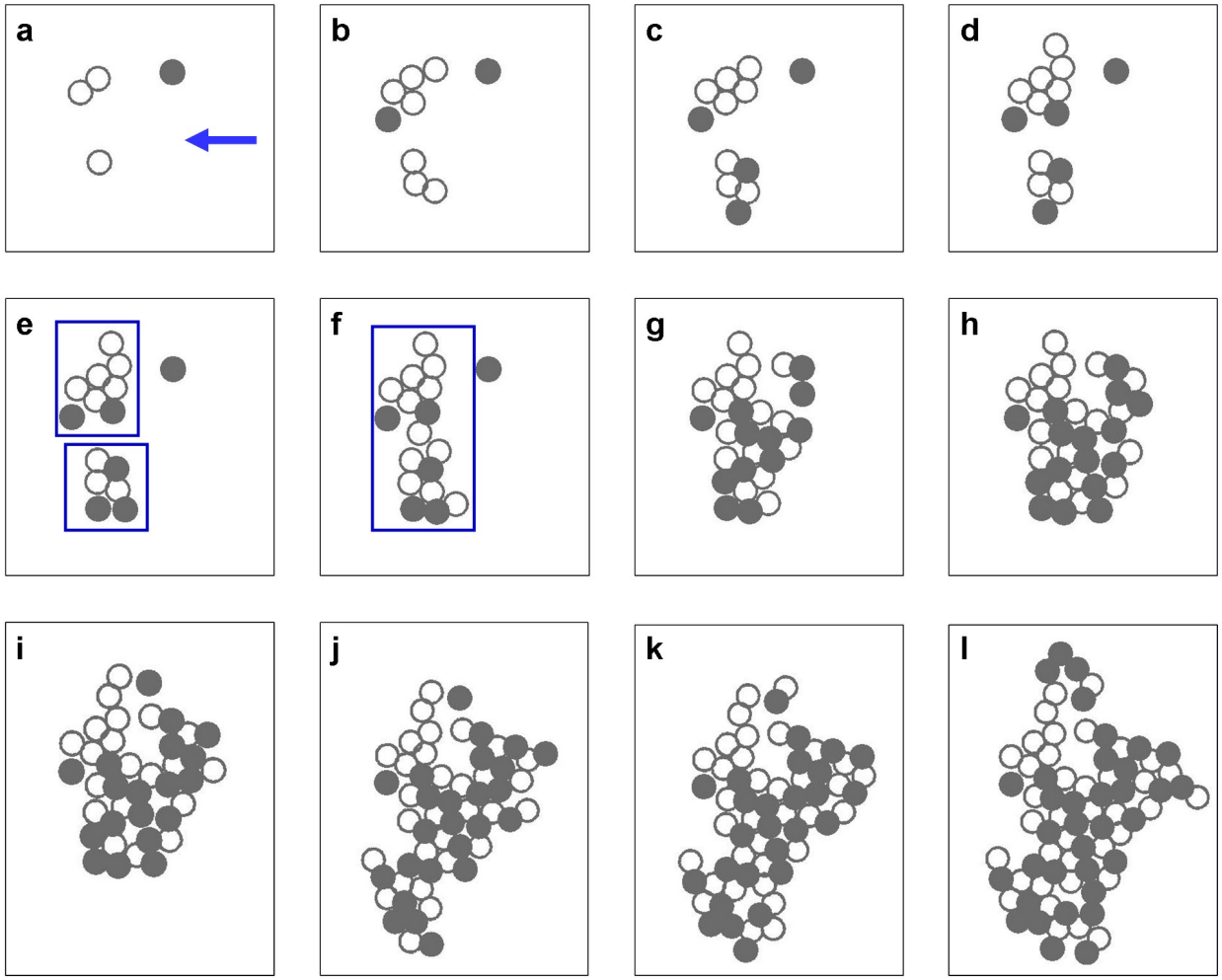

Figure 4: Successive depositions of particles and merging of small aggregates (e and f) that lead to the formation of a large aggregate. The full and the hollow circles correspond to particles that are captured by the horizontal bottom and top wall, respectively. The arrow points to the flow direction.

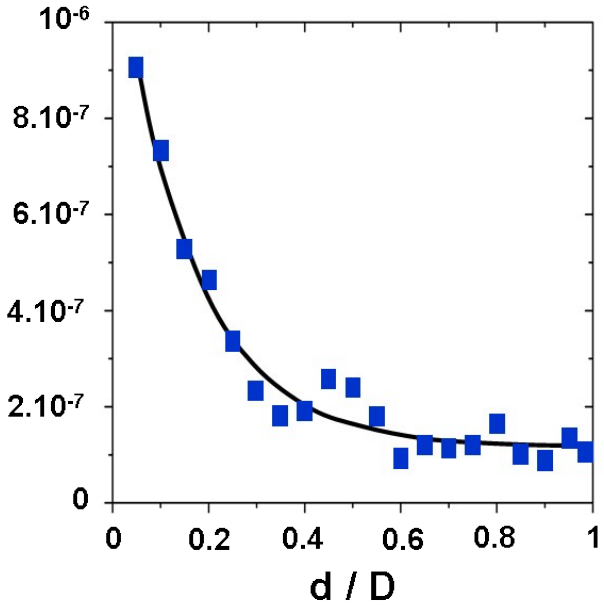

Figure 5: The probability to deposit a particle at a distance *d/D* from a particle which has just been captured. The line is an exponential fit: P=1.15 10^{-7} + 5.9 10^{-4} exp (-6.3 d/D).

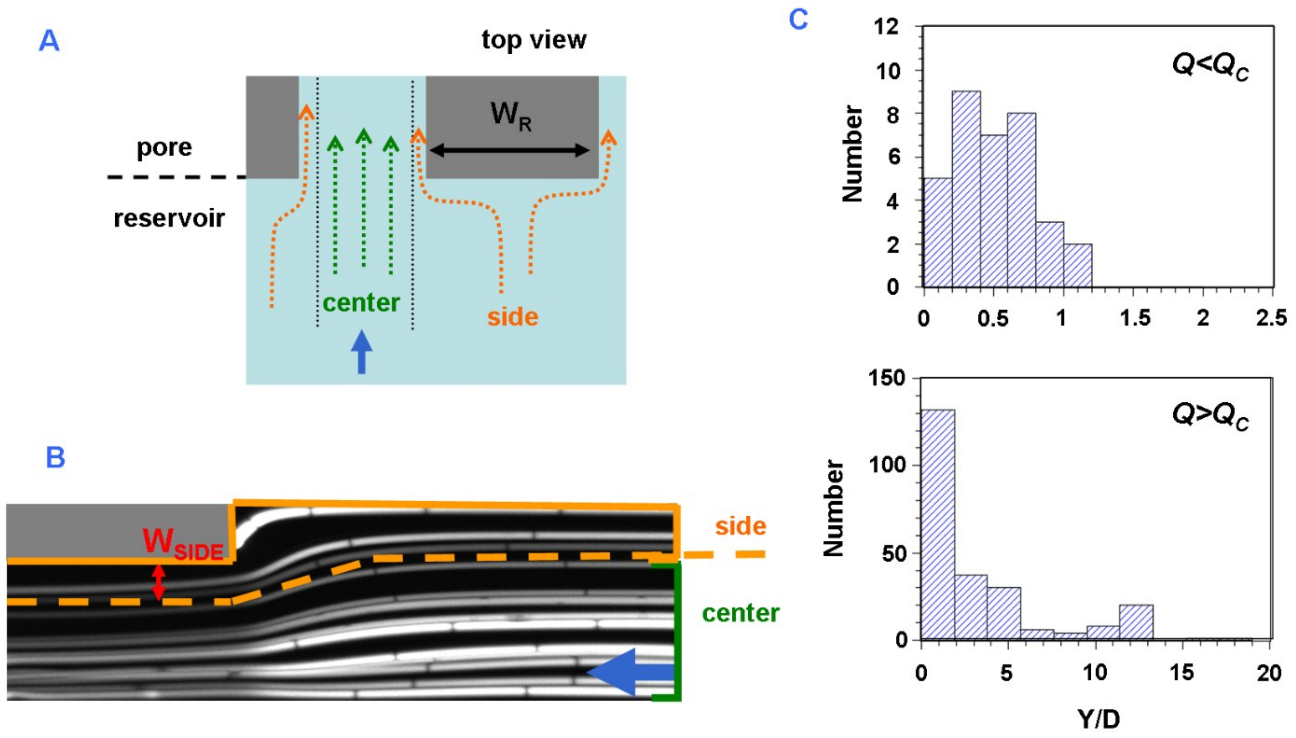

Figure 6: A-Scheme of the repartition of the particles in the reservoir zone. B- Definition of the width of the zone near the lateral walls where all the particles coming from the sides of the pore flow through. C-histogram of the distance from the pore entrance of the deposited particles coming from the sides in the line (top) and in the invasion (bottom) regimes.