Supplementary materials

# Impact of the different molecular weights of the polyethene glycol (PEG) coating agent on the magnetic targeting characteristics of the functionalized magnetoresponsive nanoclusters

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## Results

**Figure S1**. TEM images of MNC-2000.

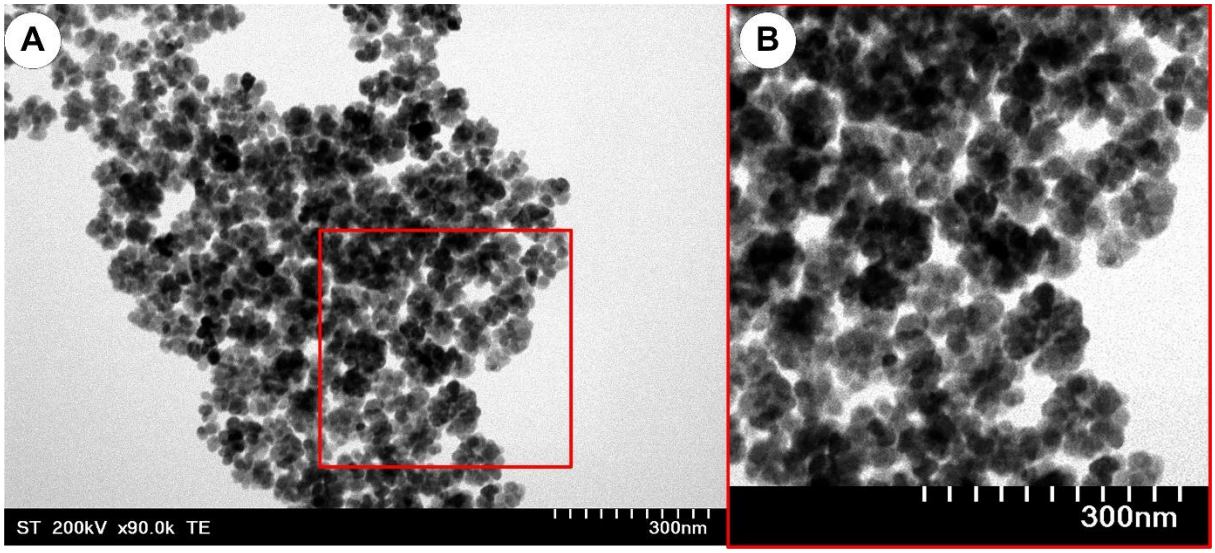



**Figure S1**. TEM images of A) MNCs-2000. The inset shows the size distribution of the clusters B). A picture of MNC-2000 with higher magnification is shown.

**Figure S2**: TEM images of MNC-6000.

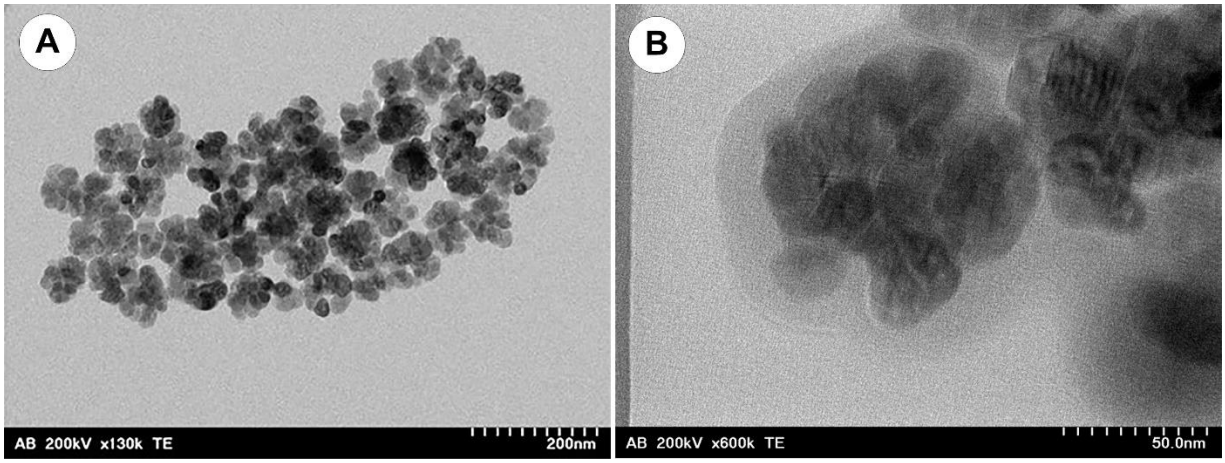



**Figure S2**. TEM images of A) MNCs-6000. B) MNCs-6000 with higher magnification shows the coating layer distribution around the magnetite clusters.

**Figure S3**: Magneto-viscous effect.

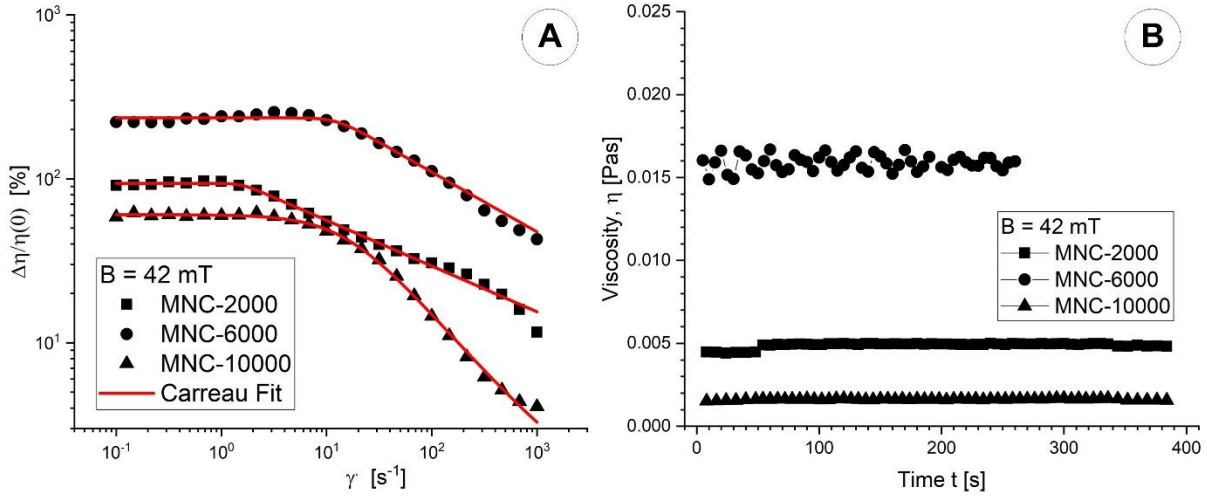



**Figure S3**. A) Magneto-viscous effects (MVE) as a function of shear rate for magnetic flux densities of 42 mT; B) Viscosity curve function of time for magnetic flux densities of 42 mT. In all rheological measurements, the MCNs mass concentration was 0.5%.

## Discussions

**Figure S4**: MNC-10000 deposition dependency of the magnet distance.

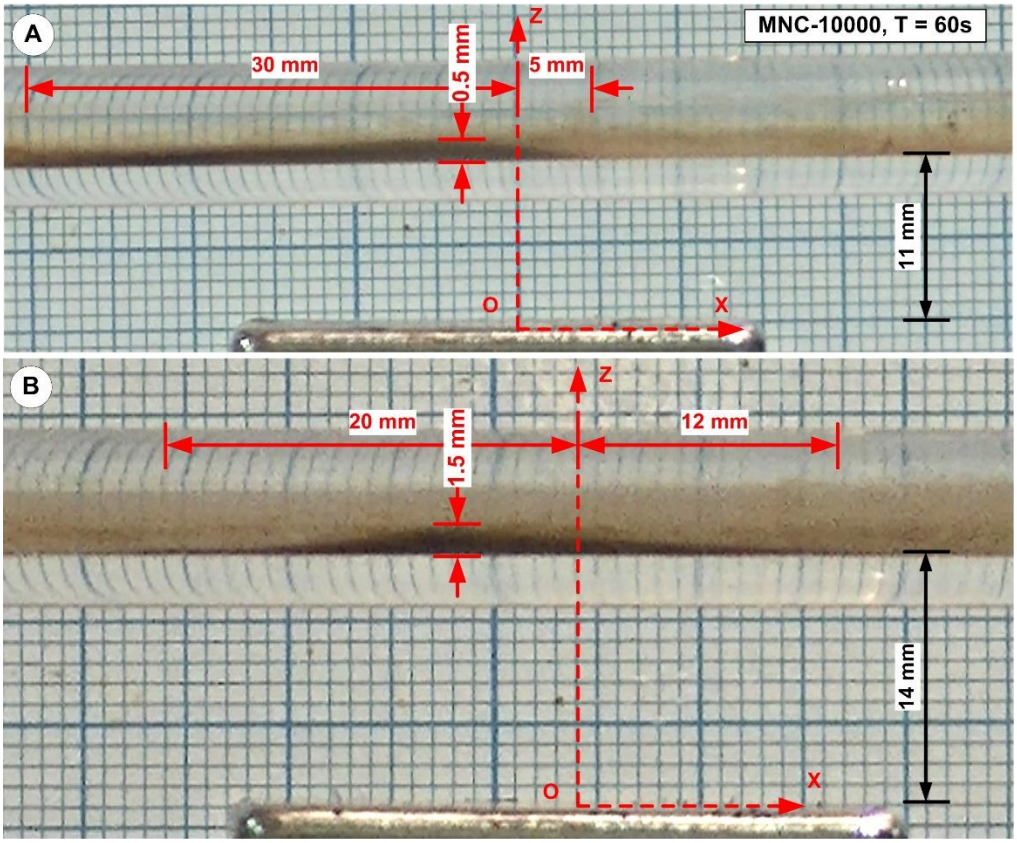



**Figure S4.** MNC-10000 retention dependency of the magnet distance. A) magnet distance of 11 mm, and B) magnet distance of 14 mm. For both cases, we have pulsatile flow, the same magnet NbFeB52 (dimensions 30x20x20), T = 60 s injection period, and 50 mg injected MNCs (MNC-10000).

**Table S1.** Characteristics of the particle accumulation shape along the artery lower wall at the end of the injection period of 60 s for injected MNC-10000 quantities of 50 mg, for different magnet distances.

| Magnet distance Dt [mm] | Injected quantity [mg] | Deposition proximal length L_p [mm] | Deposition distal length L_d [mm] | Deposition total length L_t [mm] | Deposition thickness Tn [mm] | Obstruction degree [%] | Magnet coverage degree [%] | Proximal deposition degree [%] |
|---|---|---|---|---|---|---|---|---|
| 11 | 50 | 5 | 30 | 35 | 0.5 | 16.7 | 116.6 | 14.3 |
| 14 | | 12 | 20 | 32 | 1.5 | 50 | 106.7 | 37.5 |

**Figure S5**: The impact of magnet distance on the efficiency parameters of MNC-10000.

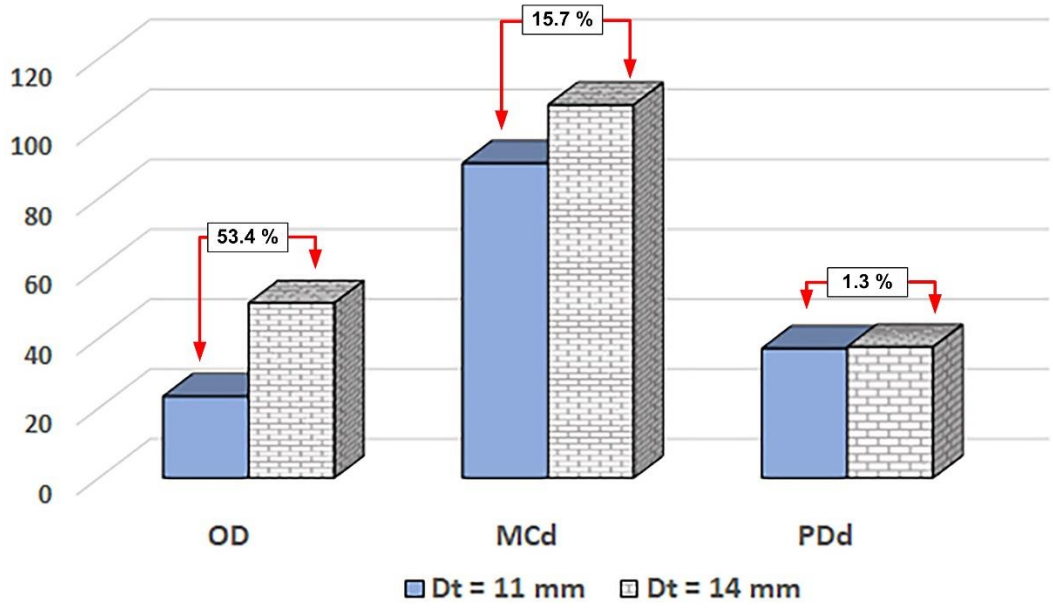



**Figure S5**. Magnet distance impacts the defined efficiency parameters for MNC-10000. Dt [mm] – represents the distance between the magnet and the vessel's lower wall. All measurements were done under the same conditions: MCN-10000 mass concentration was 0.5%, pulsatile flow, injection period of T = 60 s, and the same magnet NbFeB52 (magnet dimensions 30x20x20).

**Figure S6**: MNC-2000 deposition dependency of the injection time.

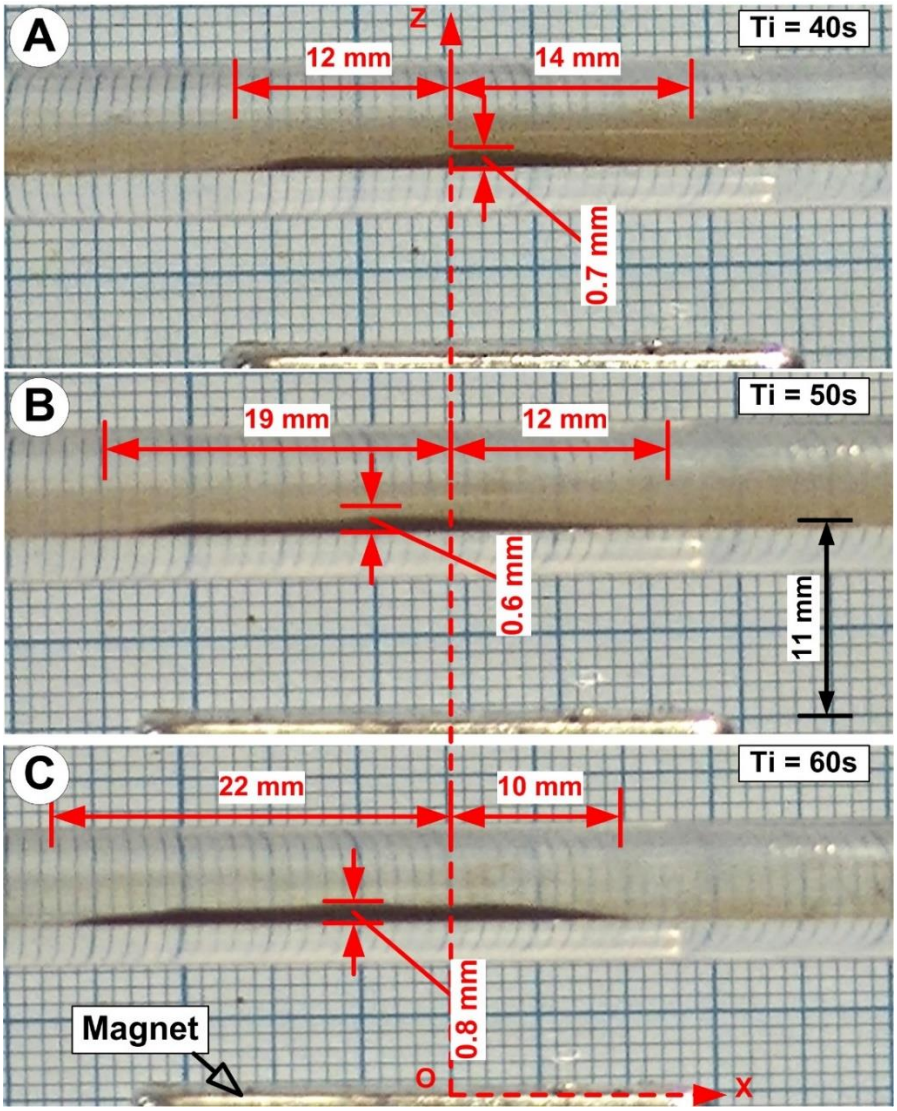



**Figure S6**. The influence of the injection time on the cluster's deposition shape for MNC-2000. A) 40 s; B) 50 s; C) 60 s. Ti = injection time [s]. The figure shows the MNC deposition geometric characteristics: total deposition length, the maximum deposition thickness, and proximal and distal deposition length. We have pulsatile flow, the same magnet NbFeB52, and 50 mg injected MNC-2000 for all cases.

**Table S2.** Characteristics of the particle accumulation shape along the artery lower wall at the end of the different injection periods for injected MNC-2000 quantities of 50 mg for the same magnet distance of 11 mm.

| Injection period T [s] | Magnet distance Dt [mm] | Injected quantity [mg] | Deposition proximal length L_p [mm] | Deposition distal length L_d [mm] | Deposition total length L_t [mm] | Deposition thickness Tn [mm] | Obstruction degree [%] | Magnet coverage degree [%] | Proximal deposition degree [%] |
|---|---|---|---|---|---|---|---|---|---|
| 40 | 11 | 50 | 14 | 12 | 26 | 0.7 | 23.3 | 86.7 | 53.8 |
| 50 | | | 12 | 19 | 31 | 0.6 | 20 | 103.3 | 38.7 |
| 60 | | | 10 | 22 | 32 | 0.8 | 26.7 | 106.7 | 31.3 |

**Figure S7**: MNC-2000 deposition dependency of the injection time.

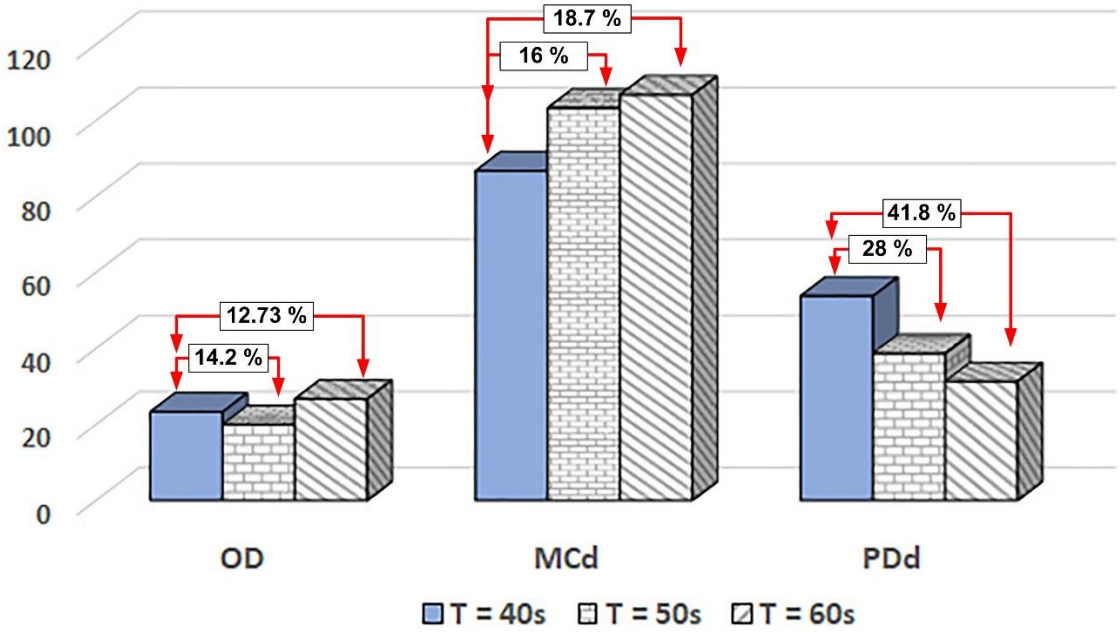



**Figure S7**. Injection time impacts the efficiency parameters for MNC-2000. T – represents the injection period. All measurements were done under the same conditions: MCN-2000 mass concentration was 0.5%, pulsatile flow was the same, and the magnet NbFeB52 was the same.