**Ionic strength responsive binding between nanoparticles and proteins**

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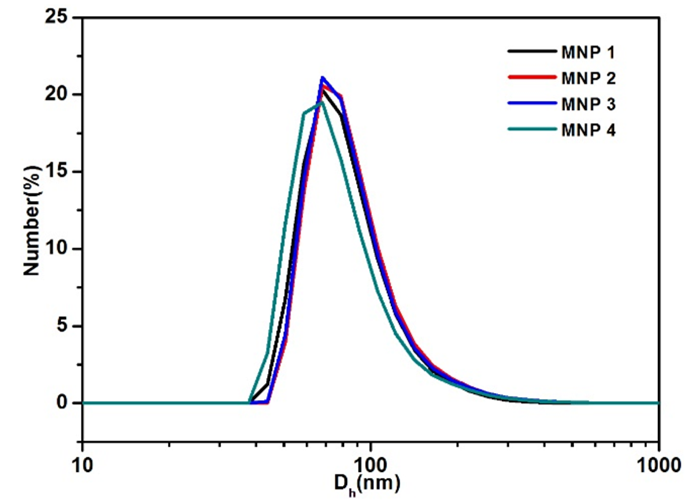
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Keywords: Magnetic nanoparticles; Protein binding; Ionic strength; Surface hydrophobicity

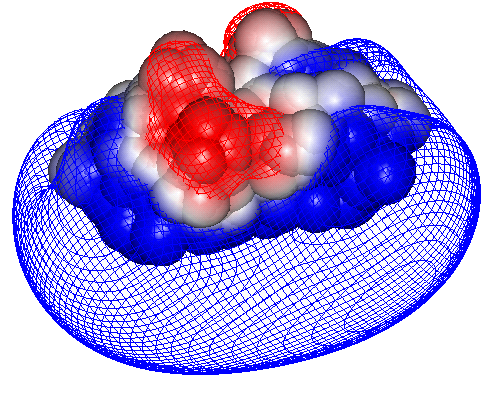
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**Figure S1. Zeta potential values of the functionalized MNP0 (a), MNP1 (b), MNP2 (c), MNP3 (d), MNP4 (e)**



**Figure S2.** **Hydrodynamic size of magnetic nanoparticles with different surface hydrophobicity, MNP1-MNP4 as monitored by DLS.**



**Figure S3. Potential surfaces (-0.1 kT/e (red) and 0.1 kT/e (blue) around BLG at I = 5 mM and pH = 4.84.** Potentials close to the protein surface (5 Å) are colored blue (positive) and red (negative).



**Figure S4. Turbidimetric titrations for blank BLG solutions at I=5 mM , 20 mM , 50 mM and 100 mM** . [BLG]=0.05mg/mL



**Figure S5. Hydrodynamic diameter of MNP1-MNP4 as a function of pH at I=5 mM.**



**Figure S6. Typical turbidimetric titration curve for BLG-MNP1 bindings at I=5 mM.** [BLG]=0.05mg/mL, [MNP]=0.02mg/mL. Blue and pink areas indicate the selective complexation and coacervation stages, respectively. Inset image is the enlarged local version for identification of the second stage as well as pHc**.**



**Figure S7. Isothermal titration calorimetry data for the binding of MNP1 (a) to MNP4 (d) on BLG in PB buffer at ionic strength of 20 mM and pH of 7.5..** 200 μL aliquot of 3.5 × 10−5 mM MNP solution was titrated with injections of BLG solution (40 μL of 0.2 mM).



**Figure S8. Isothermal titration calorimetry data for the binding of MNP1 (a) to MNP4 (d) on BLG in PB buffer at ionic strength of 50 mM and pH of 7.5..** 200 μL aliquot of 3.5 × 10−5 mM MNP solution was titrated with injections of BLG solution (40 μL of 0.2 mM)



**Figure S9. Isothermal titration calorimetry data for the binding of MNP1 (a) to MNP4 (d) on BLG in PB buffer at ionic strength of 100 mM and pH of 7.5.** 200 μL aliquot of 3.5 × 10−5 mM MNP solution was titrated with injections of BLG solution (40 μL of 0.2 mM)

**Table S1.** Thermodynamic parameters for MNP-BLG binding at I = 20 mM, 50 mM and 100 mM

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| I(mM) | NP | N | Kb×106 (M-1) | △H(cal/mol) | △S(cal/mol/K) |
| 20mM | MNP1 | 858±6.02 | 6.02±1.14 | (7.718±0.097) ×103 | 56.9 |
| MNP2 | 393±5.37 | 4.43±0.879 | (9.412±0.195) ×103 | 61.1 |
| MNP3 | 234±2.77 | 4.23±0.525 | (1.289±0.199) ×104 | 73.6 |
| MNP4 | 228±4.83 | 4.05±0.957 | (1.417±0.035) ×104 | 77.7 |
| 50mM | MNP1 | 809±10.3 | 2.49±0.394 | (5.279±0.075) ×103 | 47.0 |
| MNP2 | 818±10.8 | 2.59±0.440 | (6.452±0.095) ×103 | 51.0 |
| MNP3 | 209±3.71 | 2.64±0.512 | (1.002±0.025) ×104 | 63.9 |
| MNP4 | 150±2.45 | 2.80±0.506 | (1.131±0.026) ×104 | 68.4 |
| 100mM | MNP1 | 571±10.5 | 0.272±0.0809 | (3.520±0.374) ×103 | 36.7 |
| MNP2 | 435±34.4 | 0.301±0.0546 | (7.344±0.524) ×103 | 49.7 |
| MNP3 | 171±5.26 | 0.804±0.0882 | (8.385±0.342) ×103 | 55.1 |
| MNP4 | 235±4.02 | 1.02±0.0927 | (9.108±0.207) ×104 | 58.0 |