Structure and Elasticity of Composite Nanoparticle/Polymer Nanoshells (hybridsome®)

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1. Re-swelling of the hybridsomes after osmotic compression

Figure S1: Size distribution of SPION hybridsomes before compression, during osmotic compression (PEG 10k, 150 g/L) and after magnetic separation and washing.
2. Fit of the linear compression domain.

![Graph showing the fit of the linear compression domain]

\[
y = m_2^2(m_1 - M_0)/M_0^2
\]

<table>
<thead>
<tr>
<th>Value</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>m1</td>
<td>56.023</td>
</tr>
<tr>
<td>m2</td>
<td>18.469</td>
</tr>
<tr>
<td>Chiso</td>
<td>0.00044065</td>
</tr>
<tr>
<td>R</td>
<td>0.98105</td>
</tr>
</tbody>
</table>

Figure S2: The data of figure 4a were merged for PEG 10K, and 20K and plotted as Pressure vs Radius and then fitted with Eq. 1.

3. Liquid AFM: Imaging applying increasing tip-sample interaction forces

![AFM images showing the evolution of the morphology of a single hybridosome at increasing loads]

Figure S3: Height AFM images showing the evolution of the morphology of a single hybridosome at increasing values of loads from around 4 nN to 111 nN.
4. Influence of the IONPs composition of the membrane on susceptibility to osmotic pressure

Figure S4: Osmotic compression of hybridosomes prepared from two different concentrations of IONPs ([AA]=2.25 mM): [Fe]=12.5 µg/ml (top row) and [Fe]=25 µg/ml (bottom row), using PEG of different molecular weights: 1k; 4k; 10k; 20k, as indicated on graph. PEG concentrations: 0 g/L (black, dashed), 15 g/L (red), 50 g/L (blue), 75 g/L (green).