Supporting Information

Synthesis of Well-Defined Core-Shell Nanoparticles based on Bifunctional Poly(2-oxazoline) Macromonomer Surfactants and a Microemulsion Polymerization Process

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Table S2. Zeta potential data of the pure nanoparticles NP4 – NP6 before and after surface modification.
Experimental Section:

**NMR Experiments.** The NMR spectra were recorded on 500 MHz spectrometer AVANCE-III HDX-500 with 5mm nitrogen cooled Prodigy H(C,N) probe from Bruker BioSpin GmbH or on a 400 MHz NMR spectrometer Nanobay AVANCE-III HD-400 with 5mm BBFOsmart probe from Bruker BioSpin GmbH. The spectra were calibrated using the solvent signals (CDCl₃ 7.26 ppm).

**Zeta potential.** Zeta potential measurements were performed using a Brookhaven ZetaPALS. The experiments were carried out in 1.5 mL PS cuvette and a dipping cell at 25°C. For all measurements a 1 mg/mL aqueous NP-solution was used. For calculating the zeta potential particle solutions software were used (Version 3.1.1.3909).

**UV/vis spectroscopy.** UV/vis spectra were recorded on a UV-6300 PC Double Beam Spectrophotometer (VWR). Samples were measured at c= 1 mg/mL unless otherwise stated.

**ESI-MS:** The ESI-MS spectra were recorded on a TSQ-system composed of quadrupol mass spectrometer with an API (Atmospheric Pressure Ionization) inlet and a coupled HPLC (Spectra SYSTEM). The mass were detected with UV6000LP (Spectra SYSTEM).

**Ninhydrin test.** 5 mg of P₂ was dissolved in 5 mL CHCl₃ and 100 mg K₂CO₃ was added. After 1h stirring at room temperature the salt was filtered off and the organic solvent was removed under high pressure. The residue was dissolved in 2 mL abs. ethanol and 2 mL of 11.2 mM ninhydrin solution (0.1 g ninhydrin in 50 mL abs. ethanol) was added. Then the reaction mixture was refluxed at 90°C for 30 minutes. The solution turned blue and was analyzed via UV/vis spectroscopy at λₘₐₓ=577 nm. The formation of the Ruhemann´s complex was observed and the presence of amine groups was verified.

**Amine quantification by ¹H NMR-spectroscopy.** 20 mg of polymer P₂ (4.7 µmol), 1.6 mg of 2-bromomethyl naphthalene (7.0 µmol), 1.4 mg of K₂CO₃ (10.3 µmol) and cat. amounts of NaI in 5 mL dry acetonitrile were refluxed for 72h. The salt was removed by filtration and the organic solvent was removed. The residue was dissolved in CHCl₃ and precipitated in cold diethylether. The polymer was purified by reprecipitation in cold diethylether (3x). The precipitated polymer was removed by centrifugation and dried under high pressure.
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Figure S3. MS (ESI) of the peptide sequence GRGDS6Ahx6AhxF.

Figure S4. FTIR spectra of P1 and P2.
Figure S5. A) Ninyhdrin test of P2 to determine the primary amino end group.

Figure S5. B) Endgroup modification of P2 with 2-(bromomethyl)naphthalene and characterization by $^1$H NMR spectroscopy.
Figure S6. UV/vis spectra of NP4-NP6 FA (left) and the calibration of folic acid in 1 M NaOH solution (right).
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Figure S9. Zeta potential of the pure nanoparticles NP4 – NP6 before and after surface modification.

Table S1. Change in particle volume in water or methanol for the particles NP1 – NP6.

<table>
<thead>
<tr>
<th>Nanoparticle</th>
<th>( r_h / \text{nm} ) (H(_2)O)</th>
<th>( V / \text{nm}^3 ) (H(_2)O)</th>
<th>( r_h / \text{nm} ) (MeOH)</th>
<th>( V / \text{nm}^3 ) (MeOH)</th>
<th>Volume shrinkage / %</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP1</td>
<td>12.815</td>
<td>8 815</td>
<td>10.4</td>
<td>4 712</td>
<td>-47</td>
</tr>
<tr>
<td>NP2</td>
<td>23.52</td>
<td>54 499</td>
<td>20.74</td>
<td>37 369</td>
<td>-32</td>
</tr>
<tr>
<td>NP3</td>
<td>36.32</td>
<td>201 684</td>
<td>33.995</td>
<td>164 563</td>
<td>-18.5</td>
</tr>
<tr>
<td>NP4</td>
<td>13.075</td>
<td>9 363</td>
<td>9.33</td>
<td>3 402</td>
<td>-64</td>
</tr>
<tr>
<td>NP5</td>
<td>20.06</td>
<td>39 126</td>
<td>18.9</td>
<td>28 280</td>
<td>-28</td>
</tr>
<tr>
<td>NP6</td>
<td>35.125</td>
<td>181 525</td>
<td>34.69</td>
<td>174 864</td>
<td>-3.7</td>
</tr>
</tbody>
</table>

Particle volume has been calculated as follows: \( V = \frac{4}{3} \pi r^3 \)
Table S2. Zeta potential data of the pure nanoparticles NP4 – NP6 before and after surface modification.

<table>
<thead>
<tr>
<th>Nanoparticle</th>
<th>ζ-potential / mV (pure nanoparticles)</th>
<th>ζ-potential / mV (after modification)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP4</td>
<td>14.84 ± 0.94 Folic acid -12.64 ± 0.79</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>FITC 11.84 ± 0.17 RGD 8.30 ± 0.48</td>
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<tr>
<td>NP5</td>
<td>6.83 ± 0.88 Folic acid -1.36 ± 0.86</td>
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<tr>
<td></td>
<td></td>
<td>FITC -11.23 ± 1.01 RGD 3.96 ± 0.29</td>
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<tr>
<td>NP6</td>
<td>-9.08 ± 0.50 Folic acid -6.66 ± 0.34</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>FITC -9.09 ± 0.83 RGD -5.70 ± 0.31</td>
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</tbody>
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