Supporting information

Stabilization of DNA liquid crystals on doping with gold nanorods

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We measured the absorption spectrum of gold NRs solution and DNA LCs doped with gold NRs. The measurements were taken for the DNA LC host containing gold NRs ($C_{NR} = 0.278$ mg mL⁻¹, average length and width were 35 nm and 10 nm, respectively). The measurement confirmed the gold NRs presence in the liquid crystalline phase. The SPR peak position is sensitive to the dielectric constant of the surrounding medium. As expected, increase of dielectric constant of the surrounding medium (refractive index of water n = 1.333 and of DNA around n = 1.5) caused a slight red shift in the SPR peaks position.



Fig. S1 Absorption spectra of gold NRs in water (red line) and LC DNA doped with gold NRs (black dashed line).

The results of DSC measurements are summarized in Table S1. The lyotropic systems containing water and other dopants are complex and thus complicated for DSC analysis, because they are multicomponent systems. We performed 2 measurements for each of the solutions: the control sample (pure DNA) and NRs-doped samples. As can be seen from Fig. S2, plots are not easy to evaluate. Transition enthalpies cannot be reliably determined, since their values strongly depend on the area under the peak chosen for analysis. However, we can assume that the recorded phase transitions are first order phase transitions, which is consistent with the literature (*Melting of columnar hexagonal DNA liquid crystals,* Eur. Phys. J. B, 1998, 3). Fig. S3 presents the effect of NRs concentration on the phase transition temperatures.

C _{NR} = 0 mg mL ⁻¹		
	I measurement	II measurement
Onset [°C]	67.130	77.867
Endset [°C]	73.444	78.607
Phase transition	70.735	78.270
temperature [°C]		
∆H [J/g]	9.969	8.502
Area [mJ]	460.080	350.377
C _{NR} = 0.036 mg mL ⁻¹		
	I measurement	II measurement
Onset [°C]	74.987	76.581
Endset [°C]	77.449	77.808
Phase transition	76.654	77.101
temperature [°C]		
∆H [J/g]	10.651	3.362
Area [mJ]	457.972	129.668
C _{NR} = 0.278 mg mL ⁻¹		
	I measurement	II measurement
Onset [°C]	77.663	78.482
Endset [°C]	77.782	78.587
Phase transition	77.681	78.546
temperature [°C]		
ΔH [J/g]	0.212	1.437
Area [mJ]	8.413	75.918

 Table S1
 DSC Thermodynamic parameters obtained from DSC measurements.



Fig. S2 DSC curves obtained during a) the first measurement and b) the second measurement.



Fig. S3 Effect of NRs concentration on the phase transition temperatures.