Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting information

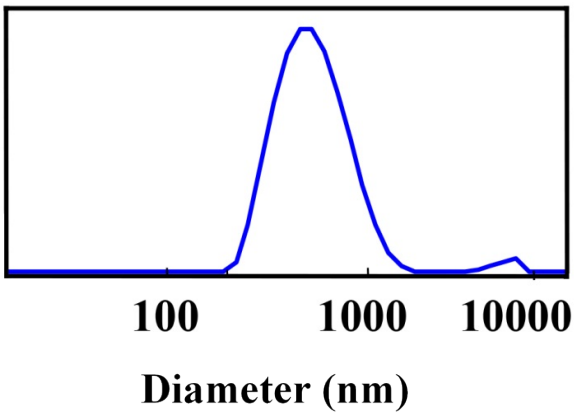

Figure S1. Size distribution profile (size drawn on a log scale) of the Dickerson DNA spheres in the emulsion measured using dynamic light scattering showing an average sphere diameter of 508 nm and some population of micron size DNA capsules.

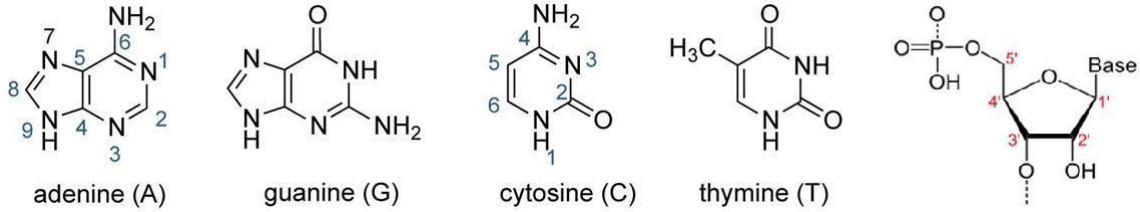

Figure S2. Atom notation for base and sugar moieties in the four nucleic acid building blocks of DNA: The notation used to describe the NMR results of particular nuclei is typically to adjoin the single letter code of the base with the position of the nucleotide along the dodecamer and to indicate the carbon or proton observed as subscript e.g. $T7_6$ indicates either C6 or H6 of thymidine residue 7 in the dodecamer sequence (starting from the 3' position). For convenience the chemical structure of the bases with the standard numbering of different atoms in the bases and sugar is shown here.

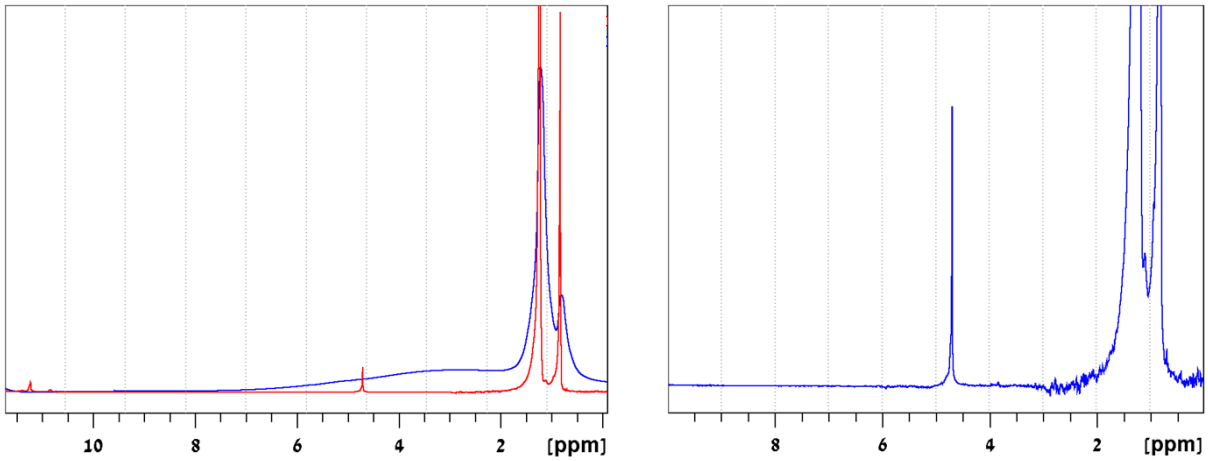

Figure S3. **(left)** Static (blue) and spinning at 5000 Hz (red) ^{1}H spectrum of sonication product in 4 mm rotor showing predominantly peaks from the encapsulated dodecane experiencing susceptibility broadening. (refs: Chen JH, Enloe BM, Xiao Y, Cory DG, Singer S Isotropic susceptibility shift under MAS: The origin of the split water resonances in 1H MAS NMR spectra of cell suspensions. Magn. Reson. in Med. 2003;50:515-521. Adebodun F, Post JFM, NMR in Biomedicine 1993;6:125-129.) **(right)** ^{1}H spectrum of Dickerson DNA capsules spinning at 5000 Hz at higher magnification showing the absence of DNA lines and dominance of the dodecane and water resonances.

Atom	$\delta^{*}_{precursor}$	$\delta^{*}_{intermediate}$	$\Delta\delta^{*}$
C1(H6)	7.61	7.66	0.05
G2(H8)	7.94	8.0	0.06
C3(H6)	7.25	7.4	0.15
G4(H8)	7.82	7.97	0.15
A5(H8)	8.08	8.08	0
A5(H2)	7.26	7.83	0.57
A6(H8)	8.07	8.05	-0.02
A6(H2)	7.62	8.02	0.4
T7(H6)	7.08	7.52	0.44
T8(H6)	7.36	7.27	-0.09
C9(H6)	7.45	7.63	0.18
G10(H8)	7.89	7.98	0.09
C11(H6)	7.31	7.42	0.11
G12(H8)	7.92	7.94	0.02

* values are reported in ppm

Table S1. Chemical shifts changes of sugar and base protons in the intermediate DNA species formed relative to original ds-DNA molecule due to ultrasonic irradiation.