Supporting Information

S1 1H NMR for dF-CD-PEG20000.

$M_w = 20000$

1-CD

ppm
**S2 Gel shift assay to confirm the uniform length of dpDNA.**

Gel electrophoresis migration patterns using NuSieve agarose gel (BMA) at 2 wt% (20 V, 3 h) were obtained and the gel was stained with GelStar® (BMA). The image was obtained using a gel documentation system (Alpha DigiDOC, Alpha Innotech).

The loaded DNA concentration was difference between (2)&(3) and (4)&(5).
Further AFM images to construct the bar chart in Fig 3.

<table>
<thead>
<tr>
<th>F/D=0</th>
<th>F/D=0.5</th>
<th>F/D=1</th>
<th>F/D=2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
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</table>
S4 Gel shift assay for dF-PEG20000+dpDNA and dF-PEG2000+dpDNA and the interpretation of the changes induced by the additions.

- 1: 1kb
- 2: dpDNA only
- 3: dF-PEG20000:dpDNA=5
- 4: dF-PEG20000:dpDNA=10
- 5: dF-PEG20000:dpDNA=15
- 6: dF-PEG20000:dpDNA=20
- 7: dF-PEG20000:dpDNA=25
- 8: dF-PEG20000:dpDNA=30
- 9: 1kb
- 10: dpDNA only
- 11: dF-PEG2000:dpDNA=5
- 12: dF-PEG2000:dpDNA=10
- 13: dF-PEG2000:dpDNA=15
- 14: dF-PEG2000:dpDNA=20
- 15: dF-PEG2000:dpDNA=25
- 16: dF-PEG2000:dpDNA=30

Increased mass due to Intermolecular bridging.

Intercalated fluorene

Decreased the hydrodynamic volume due to intramolecular bridging with the shorter PEG chain.