

Synthesis of comb-shaped DNA using a non-nucleosidic branching phosphoramidite

Satheesh Ellipilli,^a John D. Phillips^b and Jennifer M. Heemstra^{*a}

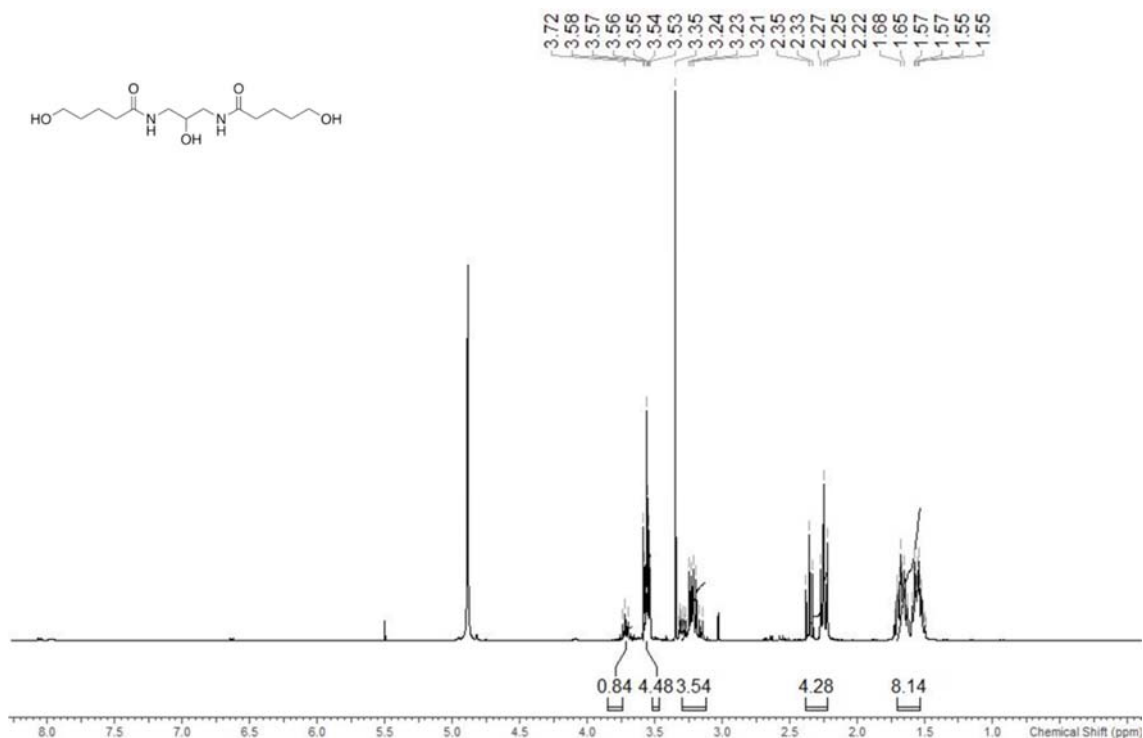
^aDepartment of Chemistry, Emory University, 1515 Dickey Drive, Atlanta, Georgia, 30322, United states E-mail: jen.heemstra@emory.edu

^bDepartment of Internal Medicine, University of Utah, Salt Lake City, Utah 84112, United States

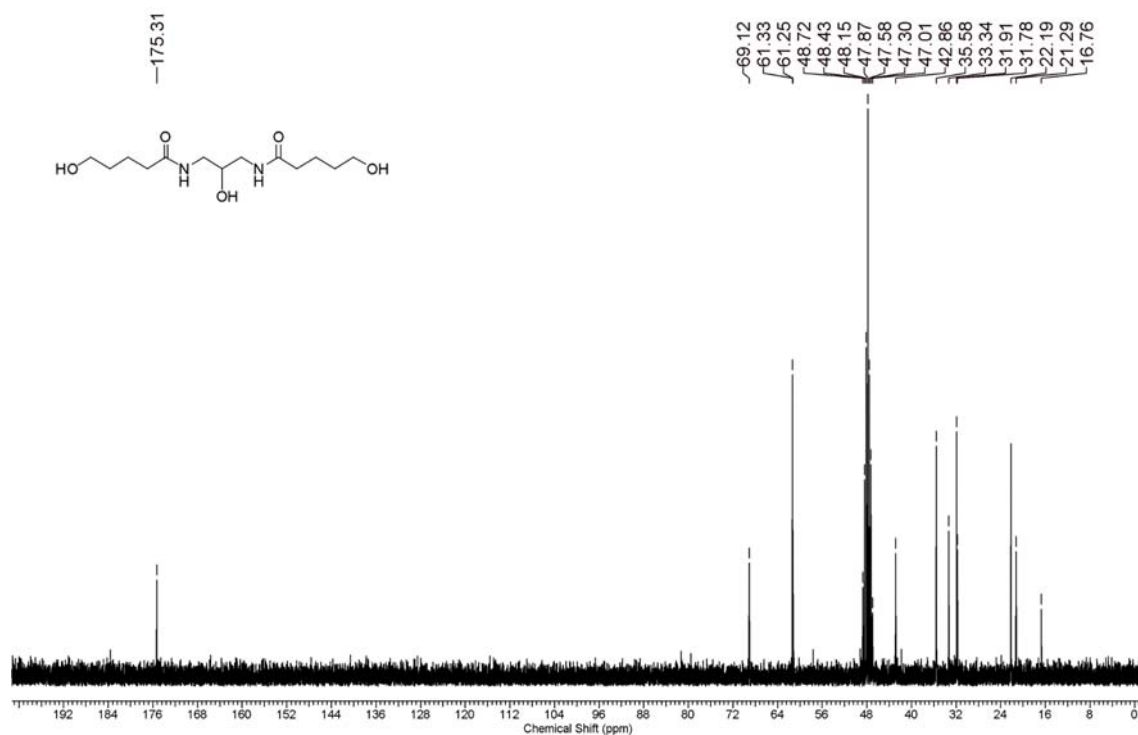
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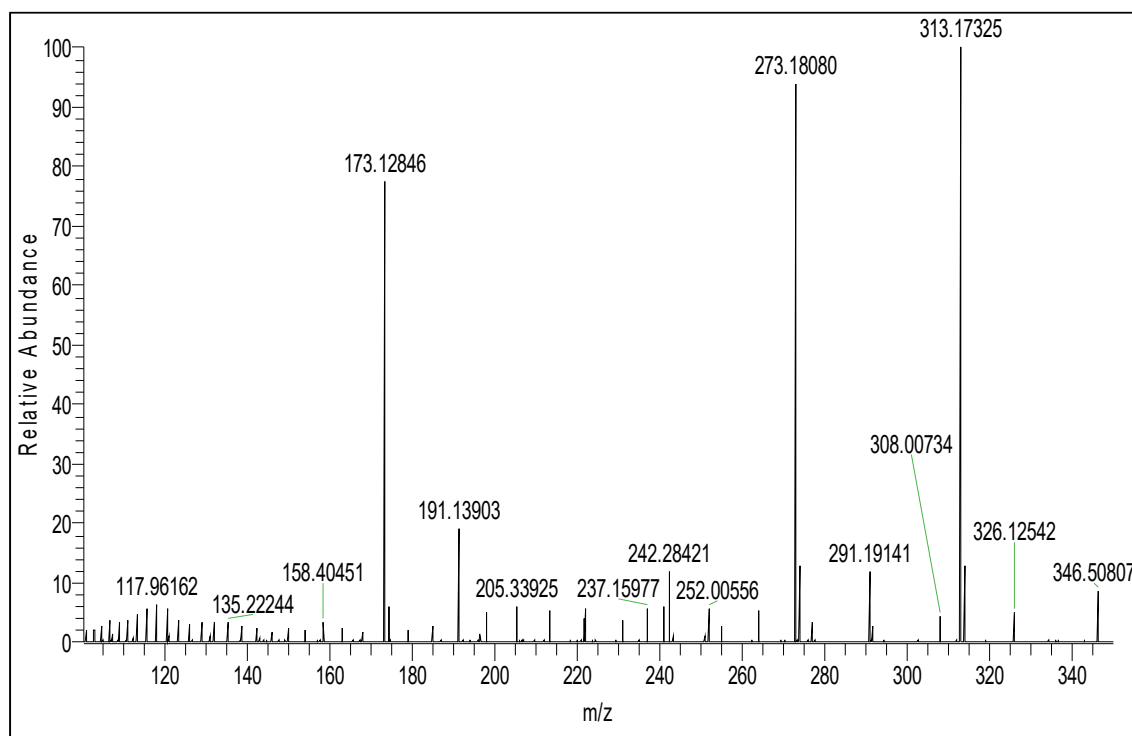
¹H-NMR of compound **2** (CD₃OD, 300 MHz)



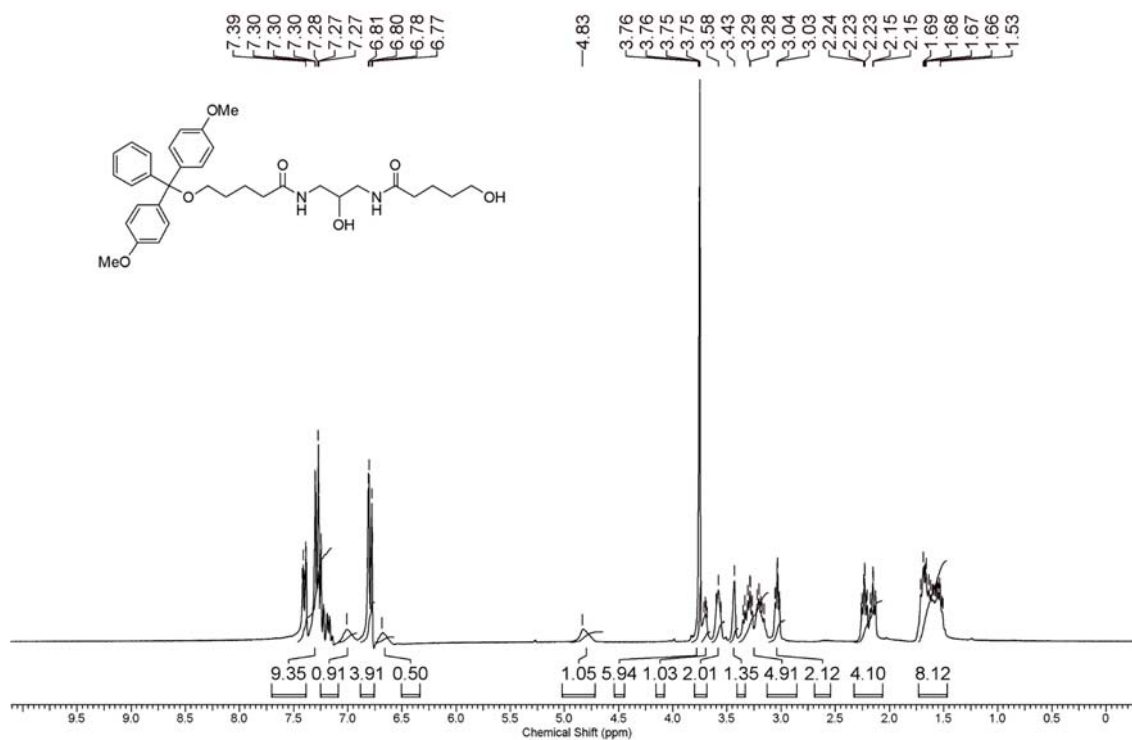
^{13}C -NMR of compound **2** (CD_3OD , 75 MHz)



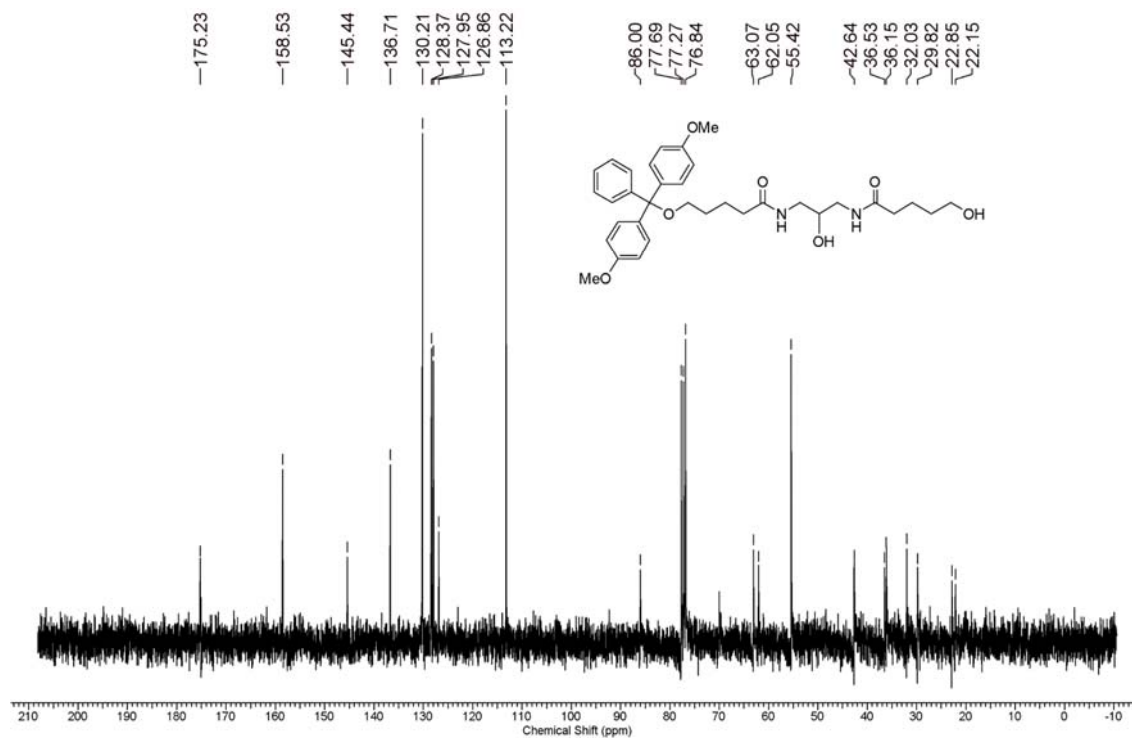
Mass spectrum of compound **2** (Calcd for $[\text{M} + \text{Na}]^+$ 313.17)



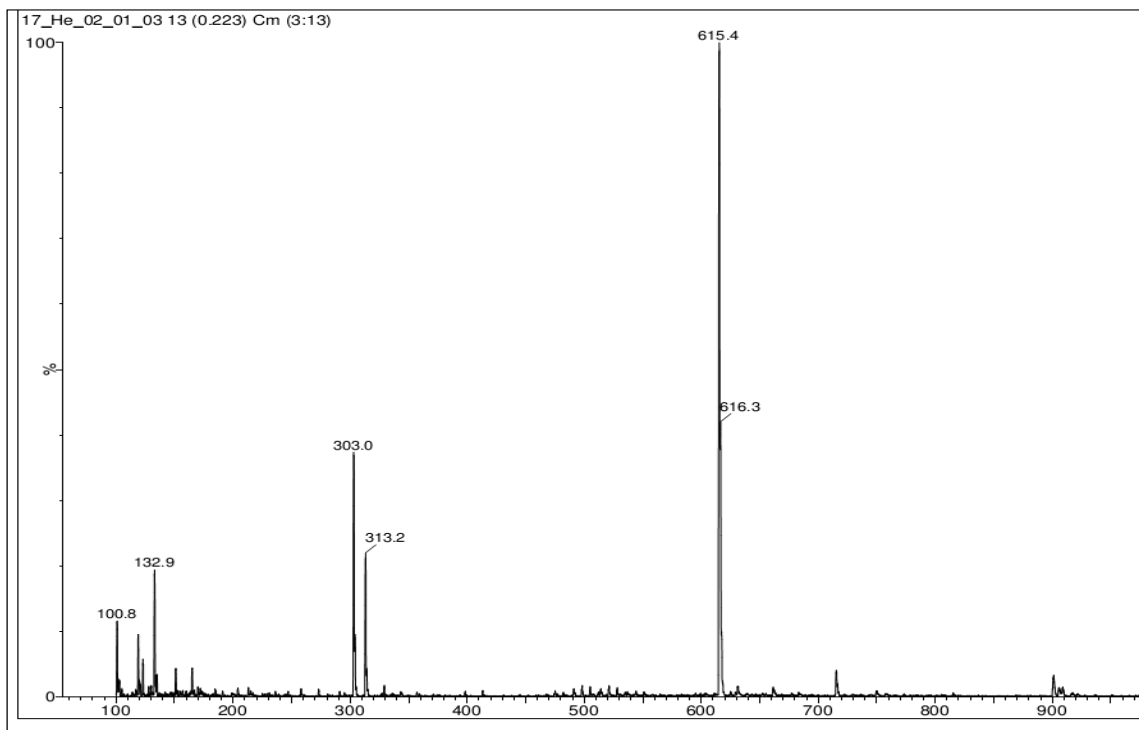
¹H-NMR of compound **3** (CDCl₃, 300 MHz)



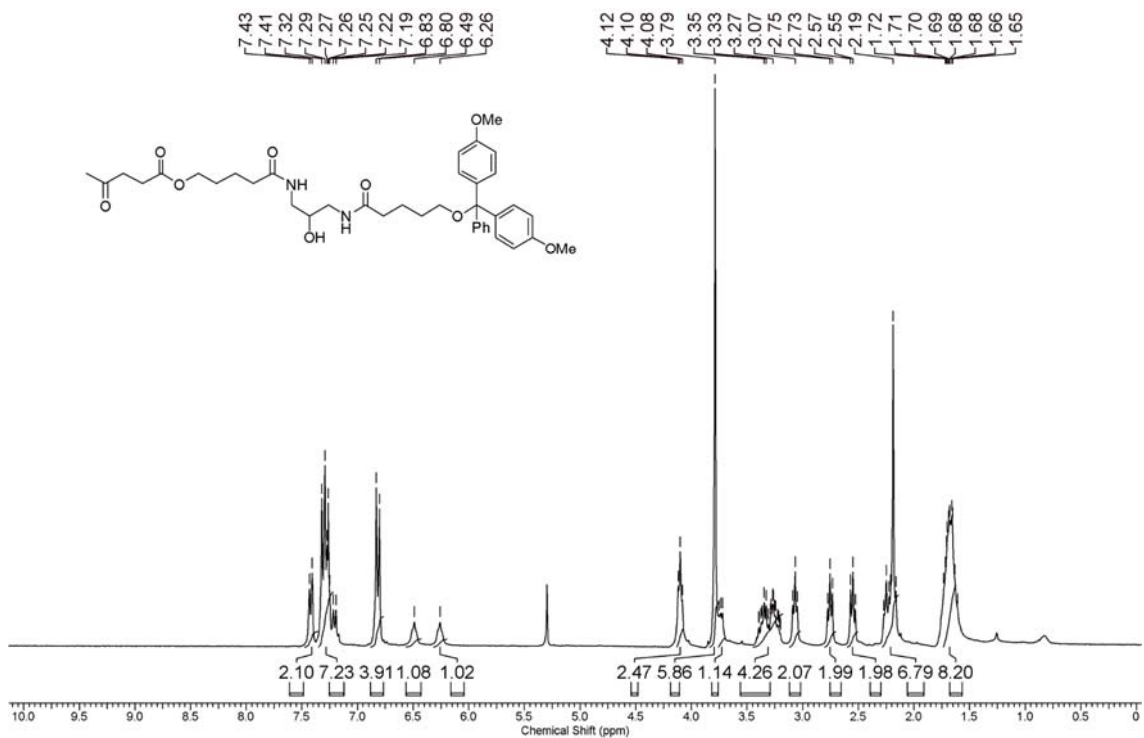
¹³C-NMR of compound **3** (CDCl₃, 75 MHz)



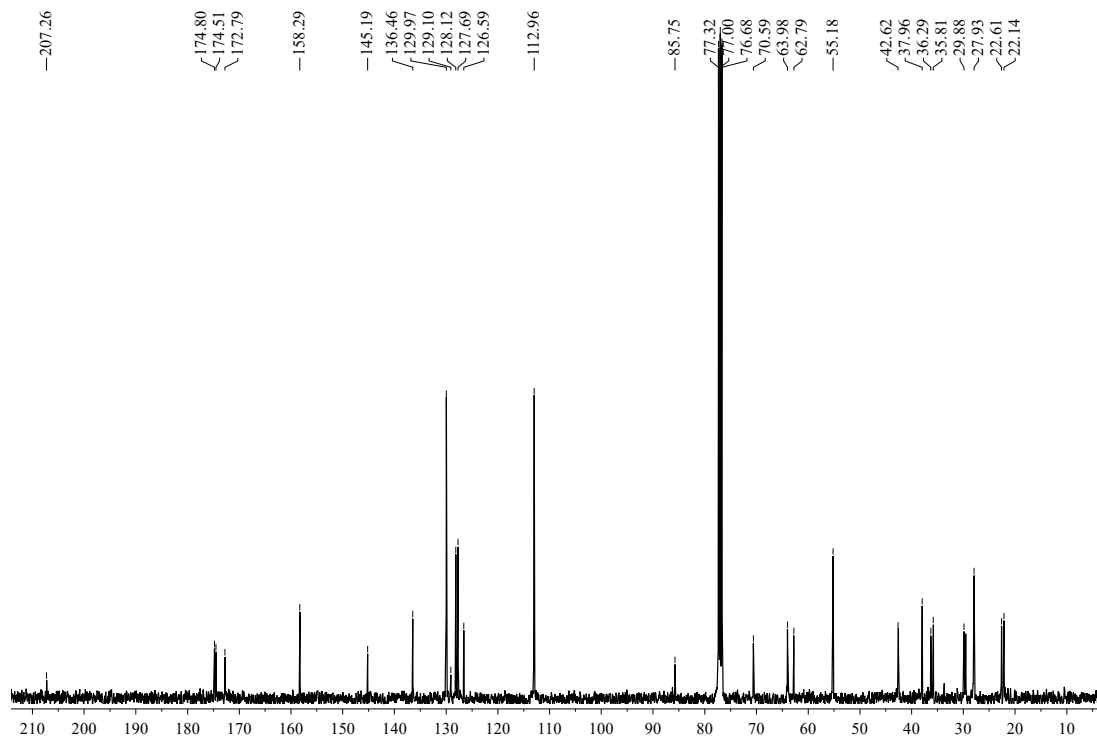
Mass spectrum of compound **3** (Calcd for [M + Na]⁺ 615.30)



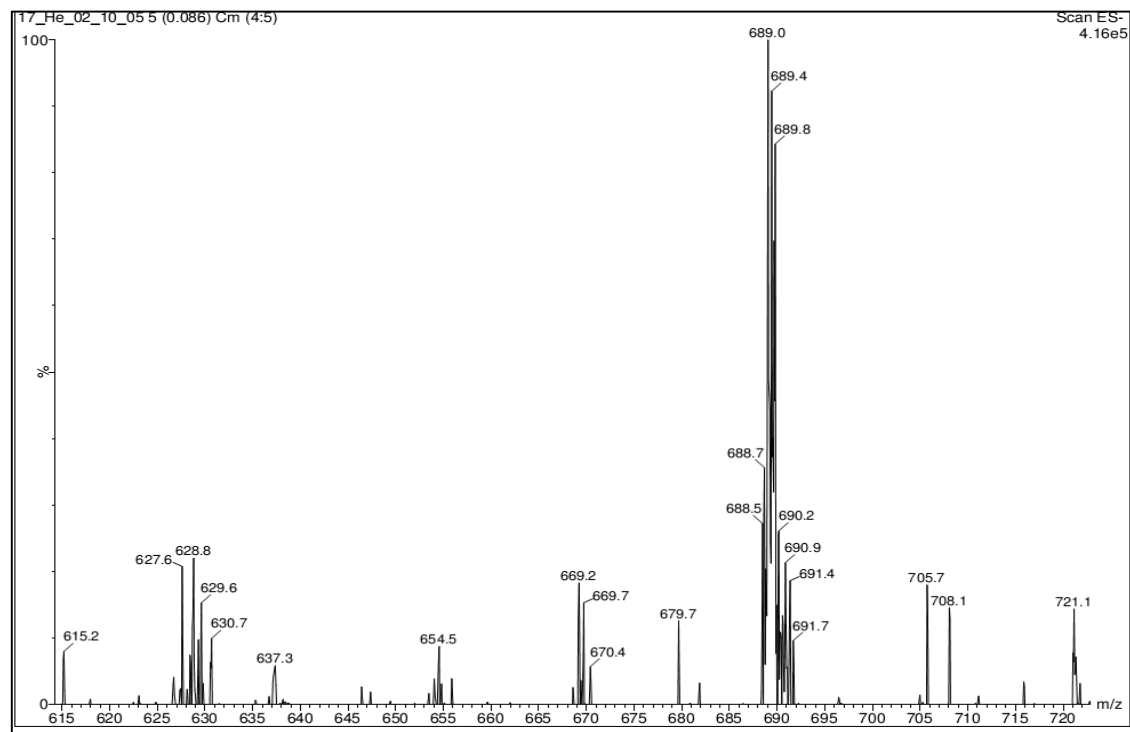
¹H-NMR of compound **4** (CDCl₃, 300 MHz)



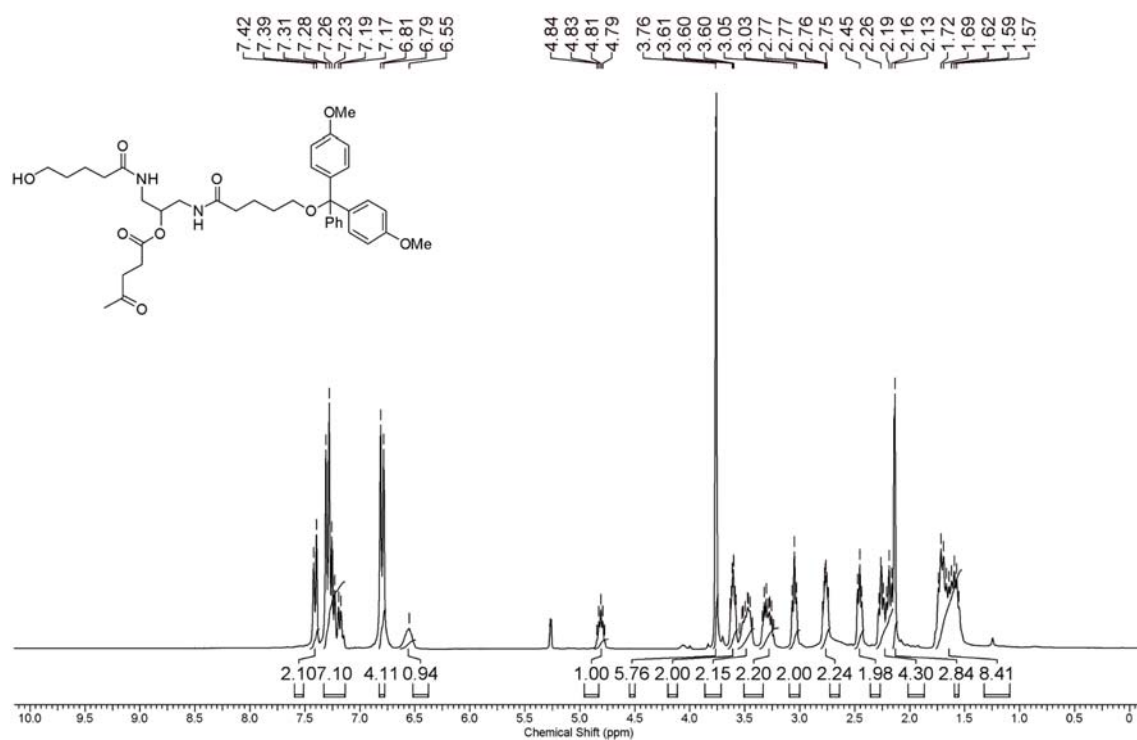
^{13}C -NMR of compound **4** (CDCl_3 , 100 MHz)



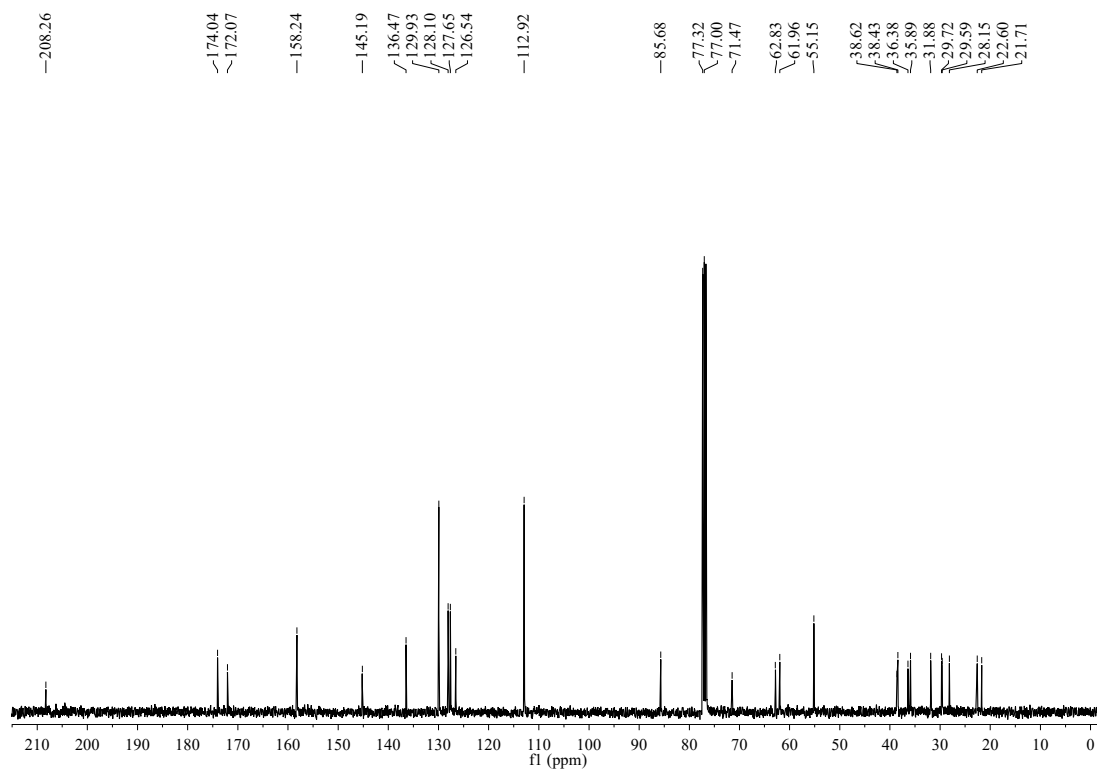
Mass spectrum of compound **4** (Calcd for $[\text{M} - \text{H}]^+$ 689.34)



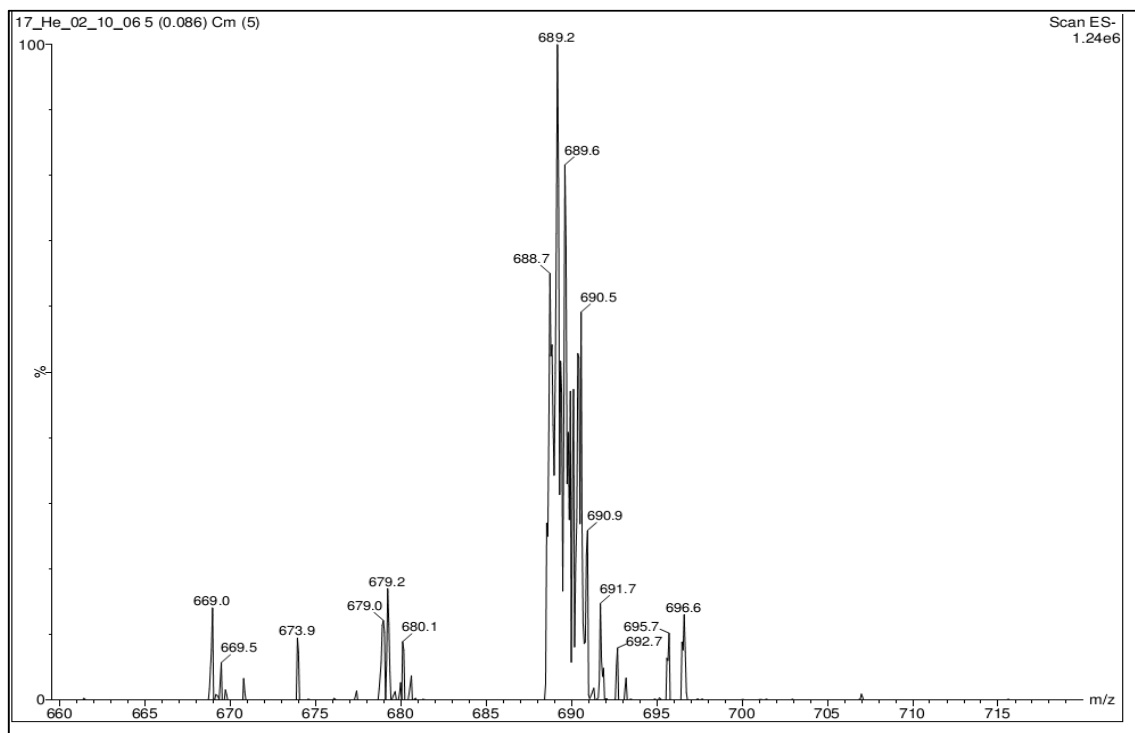
¹H-NMR of compound 5 (CDCl₃, 300 MHz)



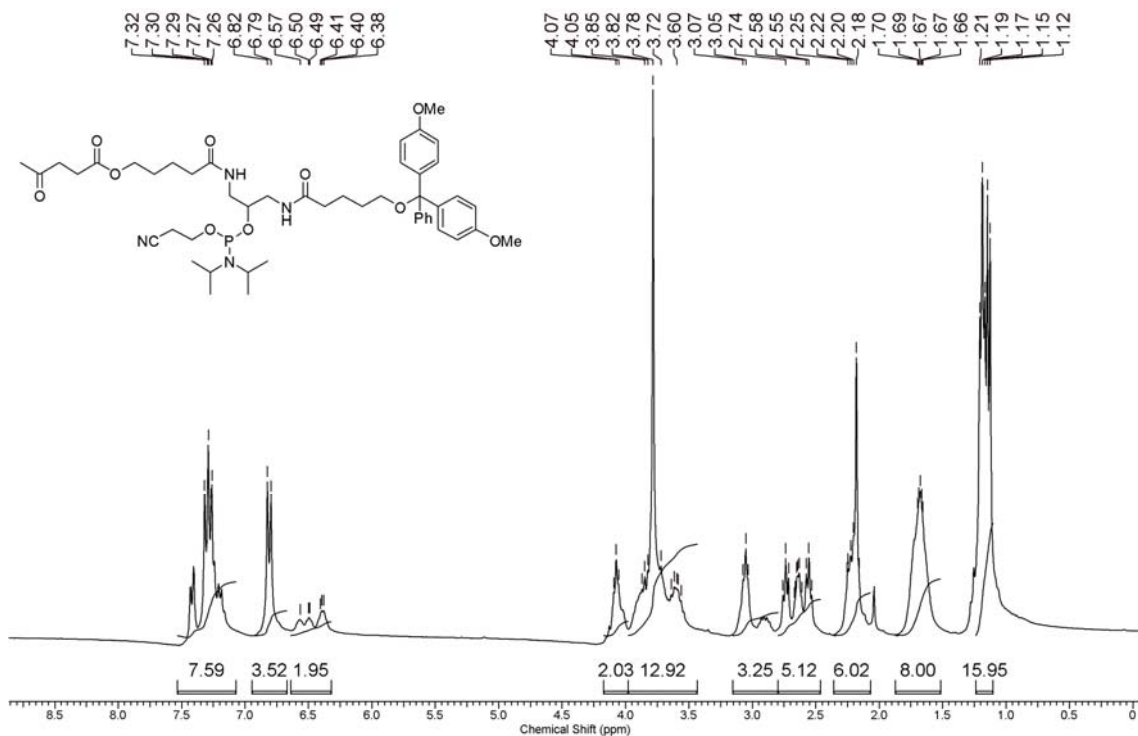
¹³C-NMR of compound 5 (CDCl₃, 100 MHz)



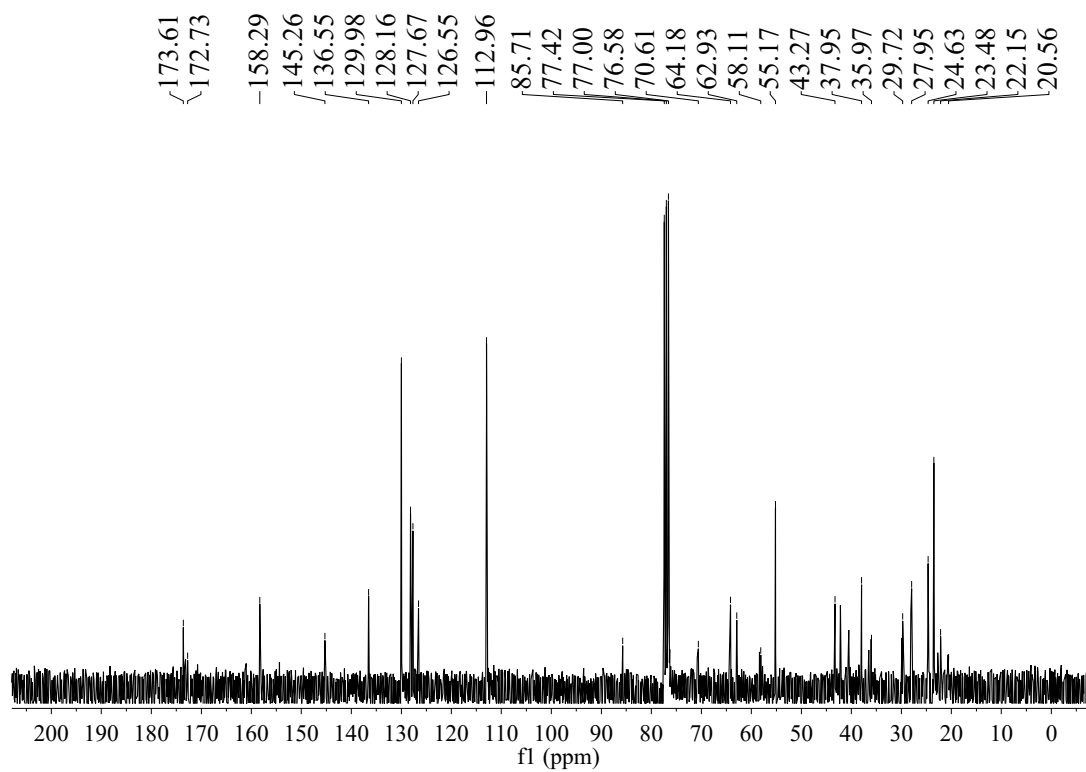
Mass spectrum of compound **5** (Calcd for $[M - H]^+$ 689.34)



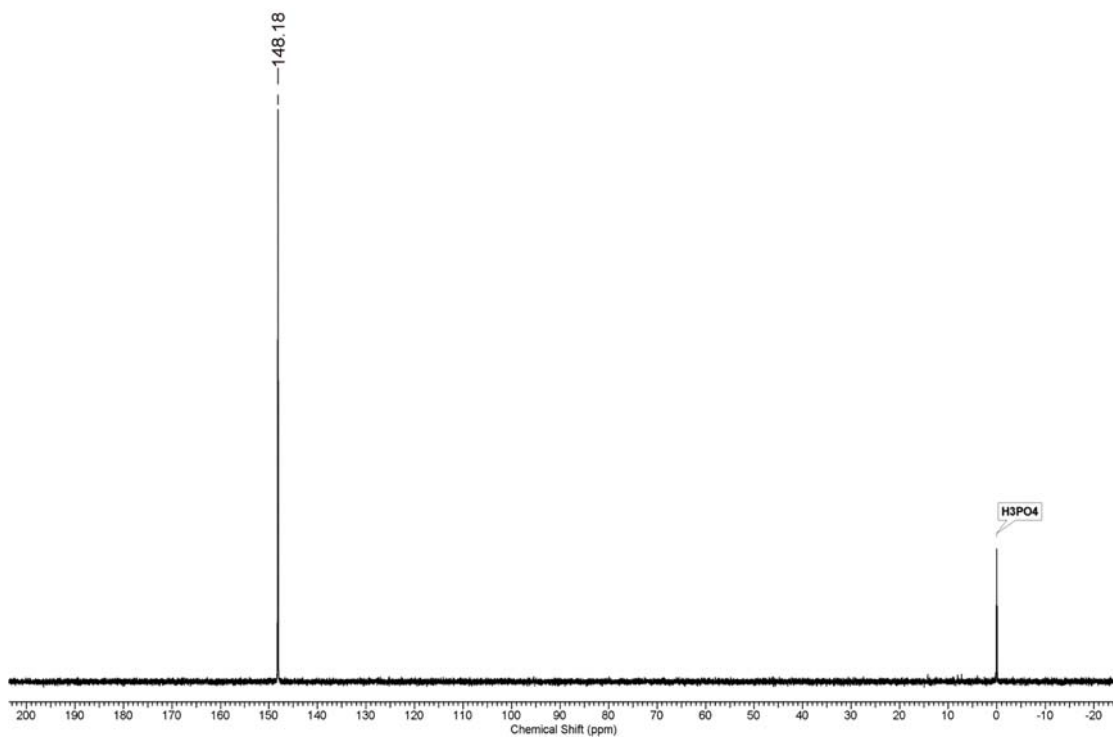
$^1\text{H-NMR}$ of compound **6** (CDCl_3 , 300 MHz)



^{13}C -NMR of compound **6** (CDCl_3 , 75 MHz)



^{31}P -NMR of compound **6** (CDCl_3 , 121.5 MHz)



Mass spectrum of compound 6 (Calcd for $[M + Na]^+$ 913.45)

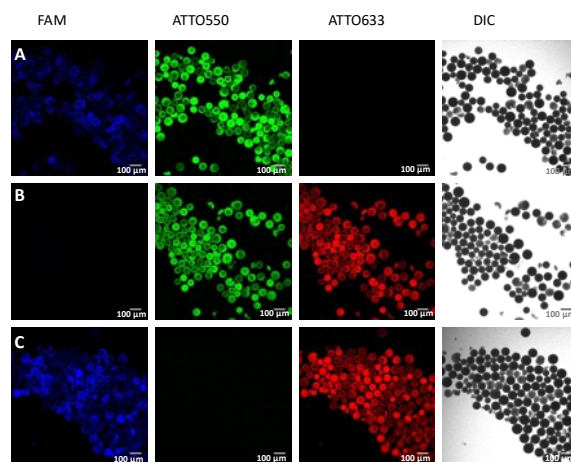
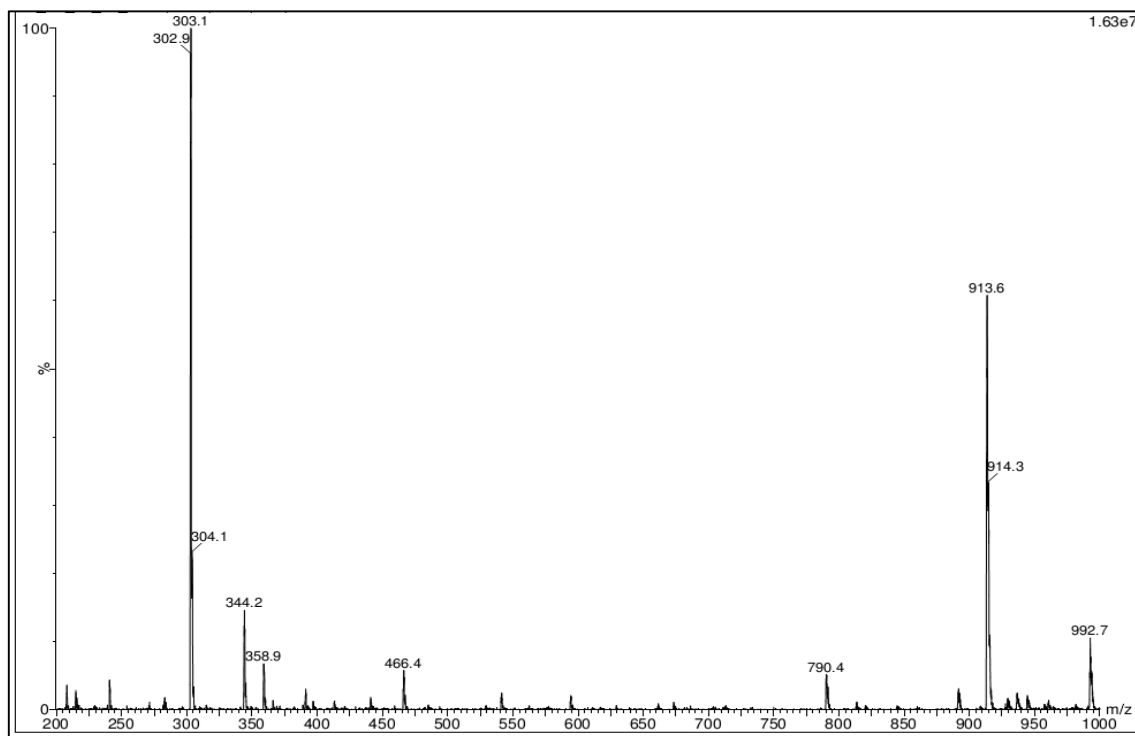


Fig. S1 Confocal images for beads incubated with two cDNA probe combinations: (A) cDNA 4 & 5; (B) cDNA 5 & 6; (C) cDNA4 & 6.

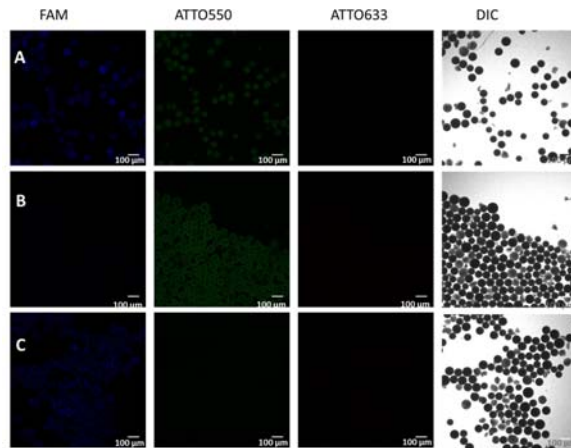


Fig. S2 Confocal images for beads incubated with two smDNA probe combinations: (A) smDNA 7 & 8; (B) smDNA 8 & 9; (C) smDNA 7 & 9.

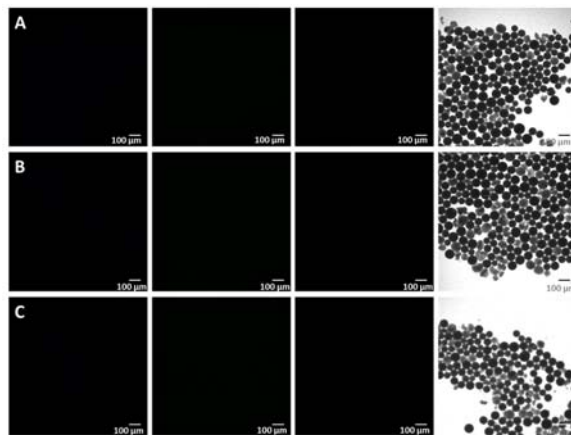


Fig. S3 Confocal images for beads incubated with two fmDNA probe combinations: (A) fmDNA 10 & 11; (B) fmDNA 11 & 12; (C) fmDNA 10 & 12.

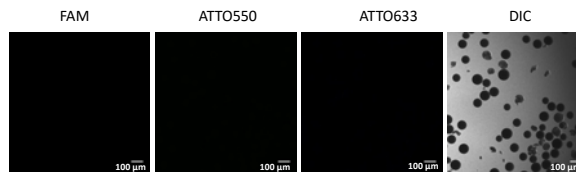


Fig. S4 Confocal images for beads incubated in the absence of DNA.

Table 1. Tabular data for reported fluorescence intensities.

Entry	DNA Probe combination	Fluorescence (a.u) from FAM	Fluorescence (a.u.) ATTO550	Fluorescence (a.u) from ATTO633
1	cDNA 4 & 5	123.88	211.04	n.d.
2	cDNA 5 & 6	n.d.	157.77	170.15
3	cDNA 4 & 6	157.41	n.d.	178.94
4	cDNA 4, 5 & 6	123.64	182.73	152.11
5	fmDNA 7 & 8	n.d.	n.d.	n.d.
6	fmDNA 8 & 9	n.d.	n.d.	n.d.
7	fmDNA 7 & 9	n.d.	n.d.	n.d.
8	fmDNA 7, 8, & 9	n.d.	n.d.	n.d.
9	smDNA 10 & 11	44.00	25.76	n.d.
10	smDNA 11 & 12	n.d.	32.33	n.d.
11	sm DNA 10 & 12	37.05	n.d.	n.d.
12	sm DNA 10-13	33.46	30.06	n.d.
13	PS-beads	n.d.	n.d.	n.d.

n.d. = not detectable