Supplementary Materials

Metal Cation Mediated Capillary Electrophoresis of Nucleic Acids

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Supporting Materials

Table S1. Summary of DNA/RNA molecules used in this study.

	Name	Sequence
Single-stranded oligonucleotides	dT_n	5'-TMR-poly $(T)_n$
	HBB-1	5'Cy3-ATGGTGCACCTGACTCCTGAGGAGAAGTCTGCCGTTACT
	HBB-2	5'Cy3-ATGGTGCACCTGACTCCTGTGGAGAAGTCTGCCGTTACT
	p53-1	5'-TMR-GAAGCTCCCAGAATGCCAGAGGCTGCTCCCCCCGTGGCCCCTGCACCAGCGACTCCTACACCG
	p53-2	5'-TMR-GAAGCTCCCAGAATGCCAGAGGCTGCTCCCCGCGTGGCCCCTGCACCAGCGACTCCTACACCG
	TMR-37mer	5'TMR-TTACACGCTTCCTCAACCACTTACCATACTCGAGATT
	C-37mer	5'-AATCTCGAGTATGGTAAGTGGTTGAGGAAGCGTGTAA
MicroRNAs	has-miR-125b	5'Cy3-UCCCUGAGACCCUAACUUGUGA
	has-miR-150	5'Cy3-UCUCCCAACCCUUGUACCAGUG
	has-miR-223	5'Cy3-UGUCAGUUUGUCAAAUACCCCA
	has-miR-382	5'Cy3-GAAGUUGUUCGUGGUGGAUUCG

Figure S1

The separation of 14 poly (dT) oligomers by 20% PAGE with a dimension of 10.5cm ×8cm×1mm. The electrophoresis was performed under 120 V for 60 min. The oligomers were labeled by tetramethylrhodamine at 5'end for fluorescence imaging. The pictures were taken by UV light irradiation.

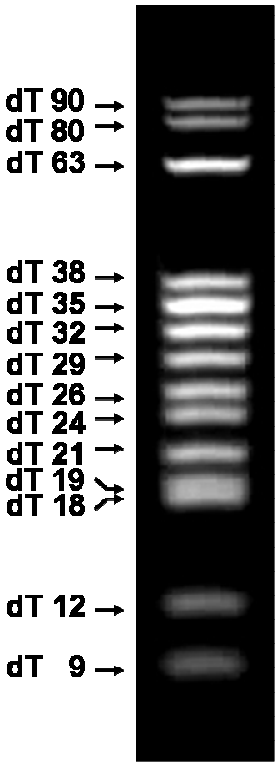
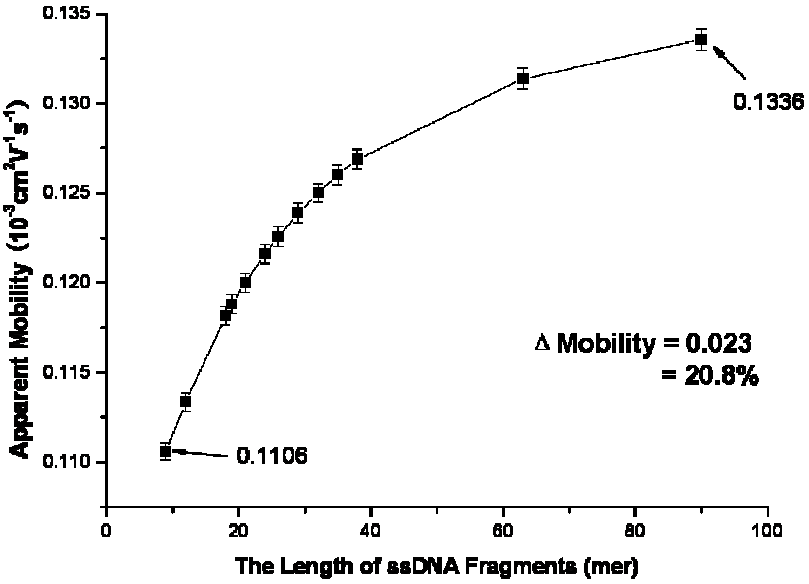


Figure S2 Measured apparent mobility of 14 poly (dT) in the presence of 2 mM $MgCl_2$.



Apparent Electrophoretic Mobility =

$$\frac{\upsilon}{\mathrm{E}} = \frac{L_{effective} \times L_{total}}{U \times t} = \frac{33.5 \times 40}{20 \times 60 \times t}(10^{-3} \cdot cm^2(V^{-1}s^{-1}))$$

v : Velocity of the oligomer (cm/s)

E : The strength of electric field (V/cm)

$L_{effective}$: The effective length of capillary (from inlet to detection window) (cm)

L_{total} : Total length of capillary (from inlet to outlet) (cm)

U : Separation voltage (kV)

t: Migration time (min)

.

Figure S3 The separation of TMR labeled p53-1 and p53-2 by 15% native PAGE (A), 15% denaturing PAGE (B), and 15% DNA sequencing PAGE (C). In each electropherogram, lanes 1 and 2 are p53-1 and p53-2, respectively. Lane 3 is the mixture of the two oligomers. The gel dimension for native and denaturing PAGE was 10.5cm×8cm×1mm. The electrophoresis was performed under 120 V for 60 min. The pictures were taken by UV light excitation. The gel dimension for sequencing PAGE was 48cm×17cm×0.3mm. The electrophoresis was performed under a constant power of 60W for 2.5h. The fluorescence pictures for native and denaturing PAGE were taken by UV irradiation, and that for sequencing gel was taken by excitation at 543.5nM (provided by a green laser).

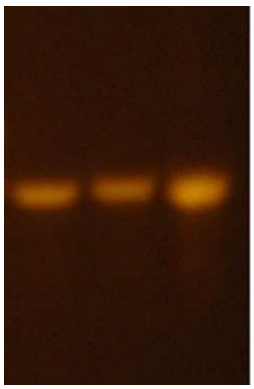


Figure S3A

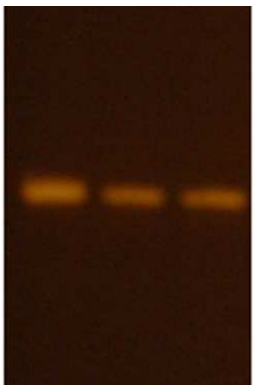


Figure S3B

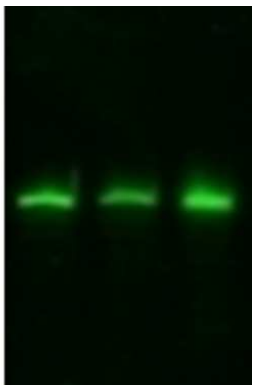


Figure S3C

Figure S4 Separation of Cy3 labeled HBB-1 and HBB-2 by 15% native PAGE (A), 15% denaturing PAGE (B), and 15% DNA sequencing PAGE (C). In each electropherogram, lanes 1 and 2 are HBB-1 and HBB-2 respectively. Lane 3 is the mixture of these two oligomers. The other conditions are the same as described in Figure S3

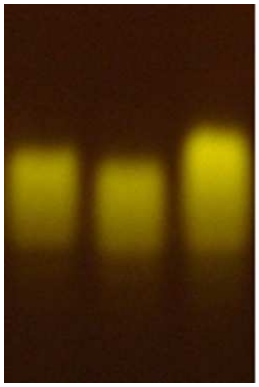


Figure S4A

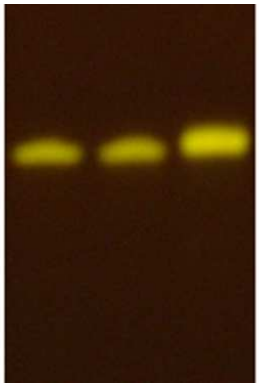


Figure S4B

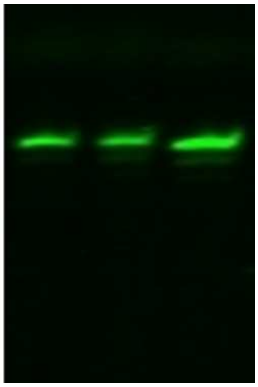


Figure S4C