Electronic Supplementary Material (ESI) for Analyst

Supplementary Information

Nano-graphene oxide as a novel platform for monitoring the effect of LNA modification in nucleic acid interactions

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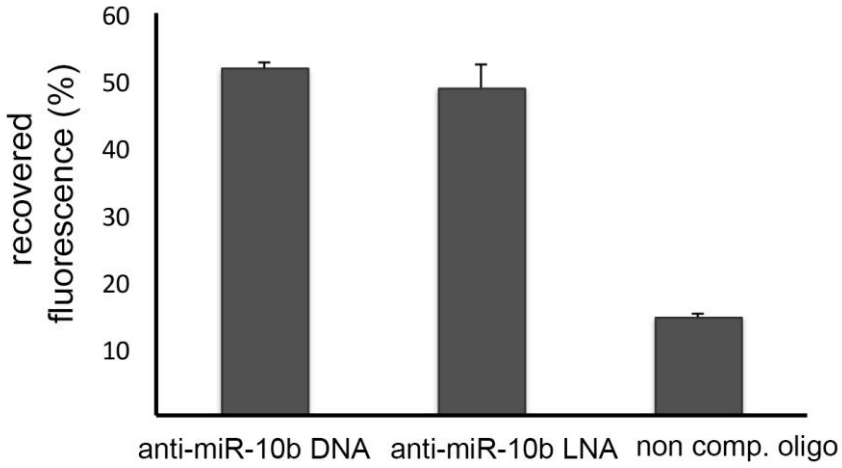

Figure S1. Desorption of FITC-labeled miR-10b DNA on graphene oxide with anti-miR-10b DNA, LNA, and non-complementary oligonucleotides. The relative fluorescence (%) recovery at 5000 seconds, (*n=3*).

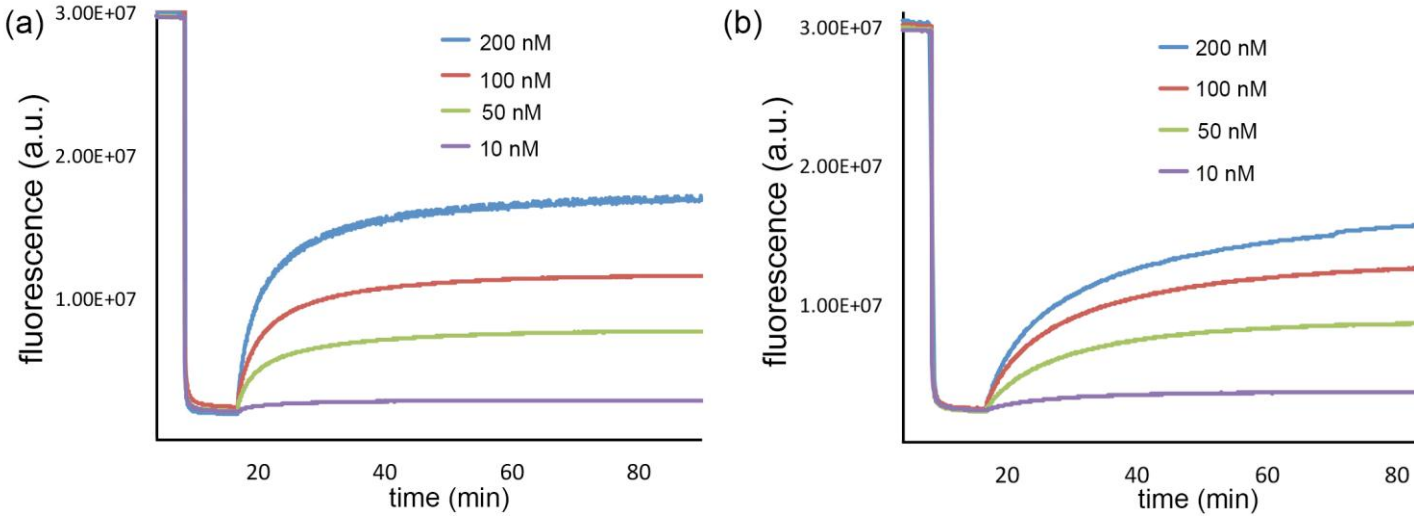

Figure S2. Adsorption of FITC-labeled miR-10b DNA on graphene oxide and its desorption with complementary oligonucleotides with and without LNA modifications. Adsorption of FITC-labeled DNA was observed by a decrease in fluorescence, while release was observed as an increase with the addition of 10, 50, 100 and 200 nM of (a) anti-miR-10b DNA or (b) anti-miR-10b LNA, ($n=3$).

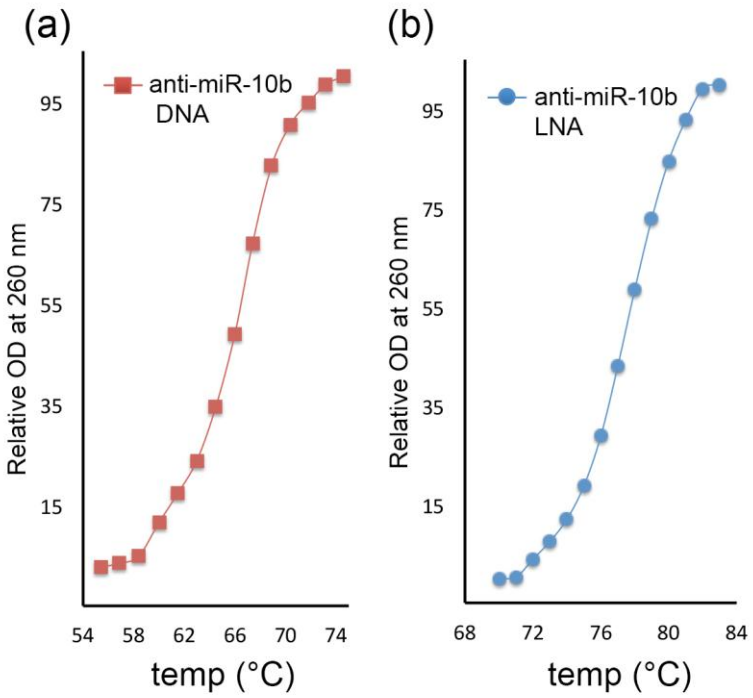

Figure S3. Real time denaturation of DNA:DNA and DNA:LNA duplexes. The melting curves of miR-10b DNA and anti-miR-10b (a) DNA (red curve) and (b) LNA (blue curve) duplexes were observed by monitoring the OD value at 260 nm with UV-Vis spectroscopy.

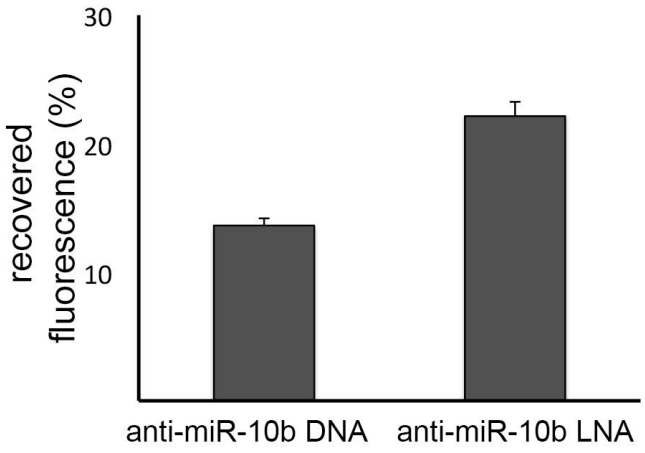

Figure S4. Complementary oligonucleotide with or without LNA modification induced desorption of FITC labeled miR-10b DNA at 70 °C. Oligonucleotides with LNA base modification induce greater release of complementary miR-10b DNA on graphene oxide due to higher duplex stability. Release after an hour is quantified by fluorescence measurements, (*n=3*).

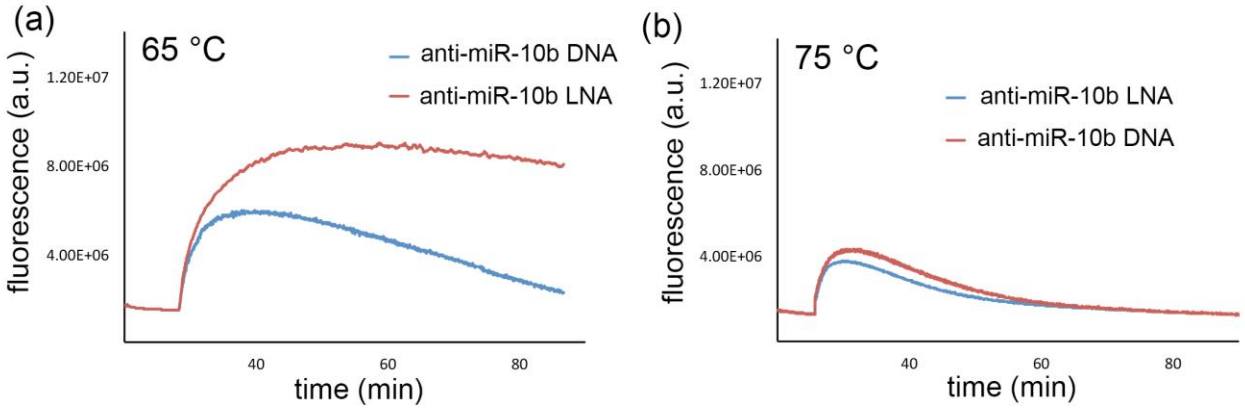

Figure S5. Complementary oligonucleotide with or without LNA modification induced desorption of FITC labeled miR-10b DNA on graphene oxide surface at (a) 65 °C and (b) 75 °C.

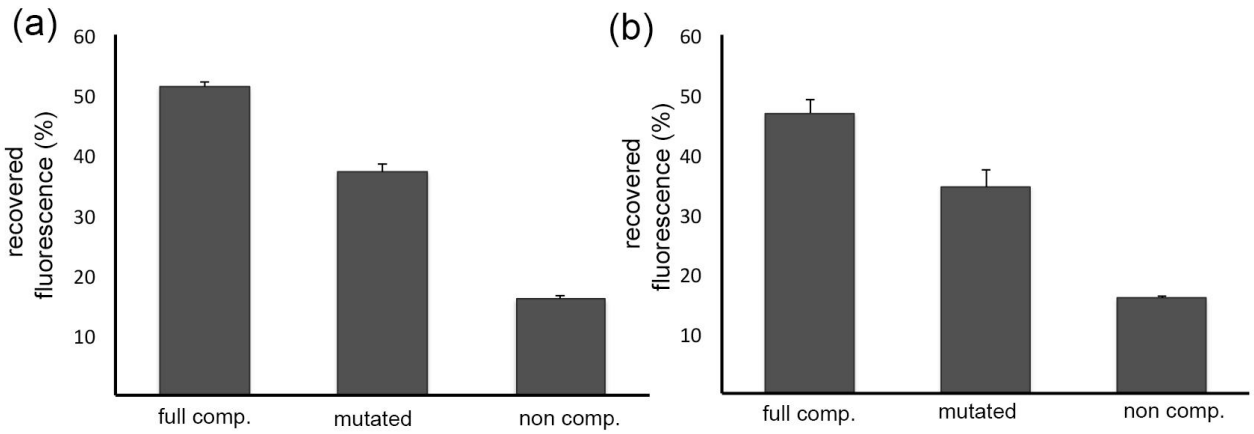

Figure S6. Desorption of FITC-labeled miR-10b DNA, mutated DNA with a single base mismatch and non-complementary DNA on graphene oxide using oligonucleotides with or without LNA modifications. Hybridization-induced desorption is monitored with anti-miR-10b (a) DNA and (b) LNA. The relative fluorescence (%) recovery at 5000 seconds, ($n=3$).