

Supplementary Information

DNA Nanostructure-based Interfacial engineering for PCR-free ultrasensitive electrochemical analysis of microRNA

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Table S1. Synthetic Oligonucleotide Probes

Probe Name	Sequence (5'-3')
Tetra-miR-21	ACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAGAGCCGCCATAGTAAAA AAAAAAATCAACATCAG
Tetra-let-7d	ACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAGAGCCGCCATAGTAAAA AAAAAAAAACTATGCAA
Tetra-miR-31	CATCTTGCCTAAAAAAAAAACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAG AAGAGCCGCCATAGTA
Tetra-B	SH-C ₆ -TATCACCAGGCAGTTGACAGTGTAGCAAGCTGTAATAGATGCGAGGGTCCAATAC
Tetra-C	SH-C ₆ -TCAACTGCCTGGTGATAAACGACACTACGTGGGAATCTACTATGGCGGCTCTTC
Tetra-D	SH-C ₆ -TTCAGACTTAGGAATGTGCTTCCCACGTAGTGTGCTTTGTATTGGACCTCGCAT
swRP-miR-21	TCTGATAAGCTA-BIOTIN'
swRP-let-7d	CCTACTACCTCT-BIOTIN'
swRP-miR-31	BIOTIN'-AGCTATGCCAG
SH-ss-miR-21	SH-C ₆ -TAAATAAATATCAACATCAG
miD-21	TAGCTTATCAGACTGATGTTGA

Table S2. Sequences of mature human miRNAs

miRBase ID	Sequence (5'-3')	Accession#
hsa-mirR-21	UAGCUUAUCAGACUGAUGUUGA	MIMAT0000076
hsa-miR-31	AGGCAAGAUGCUGGCAUAGCU	MIMAT0000089
hsa-let-7a	UGAGGUAGUAGGUUGUAUAGUU	MIMAT0000062
hsa-let-7b	UGAGGUAGUAGGUUGUGUGGUU	MIMAT0000063
hsa-let-7c	UGAGGUAGUAGGUUGUAUGGUU	MIMAT0000064
hsa-let-7d	AGAGGUAGUAGGUUGCAUAGUU	MIMAT0000065
hsa-let-7e	UGAGGUAGGAGGUUGUAUAGUU	MIMAT0000066
hsa-let-7f	UGAGGUAGUAGAUUGUAUAGUU	MIMAT0000067
hsa-let-7g	UGAGGUAGUAGUUUGUACAGUU	MIMAT0000414
hsa-let-7i	UGAGGUAGUAGUUUGUGCUGUU	MIMAT0000415
hsa-miR-98	UGAGGUAGUAAGUUGUAUUGUU	MIMAT0000096

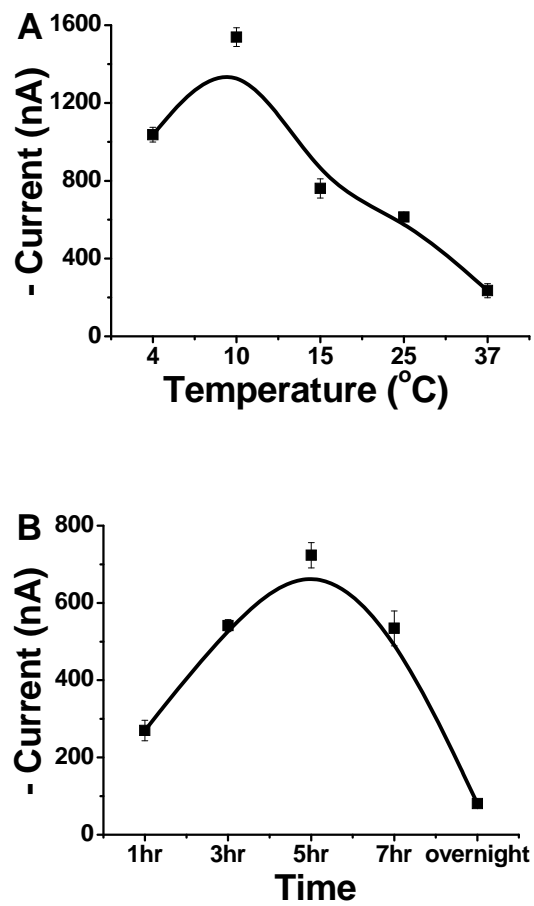


Figure S1. Effect of (A) hybridization temperature (of 1 nM miR-21 in 5hr hybridization) and (B) hybridization time (of 10 pM miR-21 hybridization at 10 °C) for tetrahedra-based EMRS. Error bars represent standard deviations for measurements taken from at least three independent experiments.

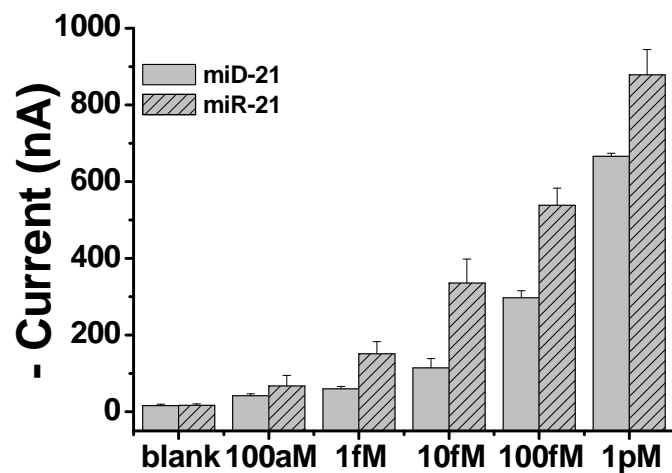


Figure S2. Comparison for detection of DNA and RNA with tetrahedra-based EMRS.

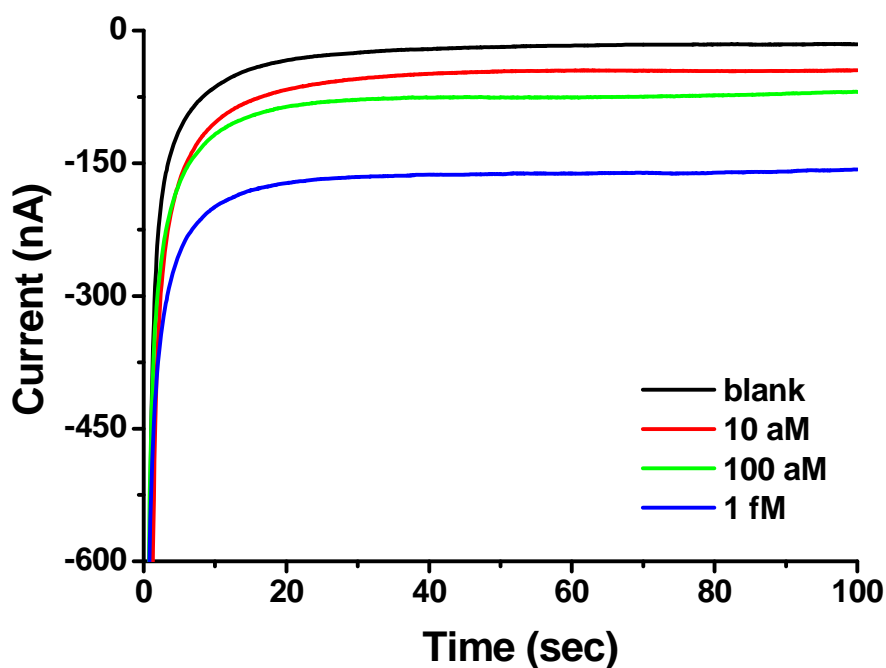


Figure S3. Amperometric curves (i-t) for EMRS with poly-HRP80 tested with miR-21 of ultralow concentrations (10 aM, 100 aM, 1 fM) and the blank solution. The data are shown in the inset of Fig. 4A.