

Extraction of MicroRNAs from Biological Matrices with Titanium Dioxide Nanofibers

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Electronic Supplementary Information

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Table S1. Sequence of DNA and miRNA used for recovery.

DNA/ RNA	Sequence
WA DNA	AGCAGCACAGACGTCAGATGATGGGGCACGTTTATCCGTCCCTCCTAGTG GCGTGCCCCTCCTATGCGTGCTACCGTCAA
cel- miR- 54-3p	UACCCGUAUAUCUUCAUAAUCCGAG
hsa- miR- 21-5p	UAGCUUAUCAGACUGAUGUUGA
hsa- miR- 191-5p	CAACGGAAUCCCAAAGCAGCUG

Table S2. Absorption wavelength of 1 M guanidine HCl sample compared to an elution of extraction after undergoing washes. Guanidine HCl, which absorbs at 230 nm, is greatly reduced after washes.

λ of Absorbance	220 nm	230 nm	250 nm
Guandine HCl	0.373	0.555	0.058
Elution in TE	0.112	0.062	0.000

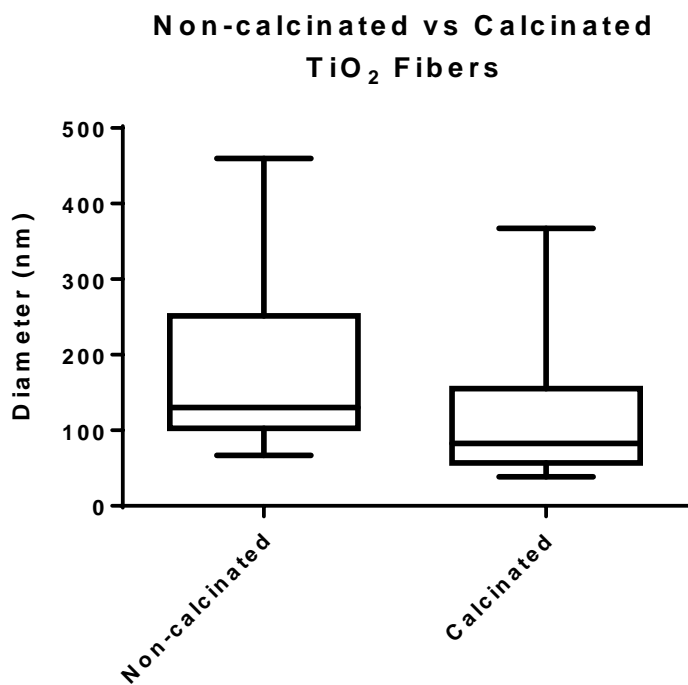


Figure S1. TiO₂ fiber measurements were done using imageJ and scanning electron microscopy images. The pre-calcinated fibers (n = 169) had an overall larger diameter than the post-calcinated fibers (n = 62) with averages of 191.5 nm and 126.5 nm respectively.

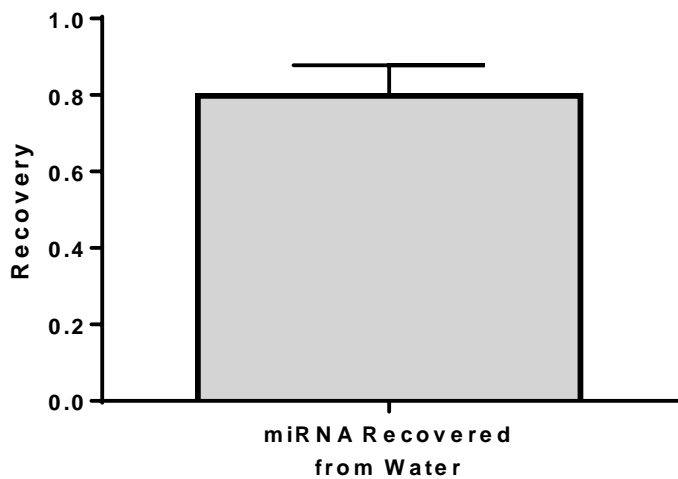


Figure S2. Recovery of cel-miR-67 spiked into water using the TiO₂ fibers was 79.8±0.05% (n = 3).

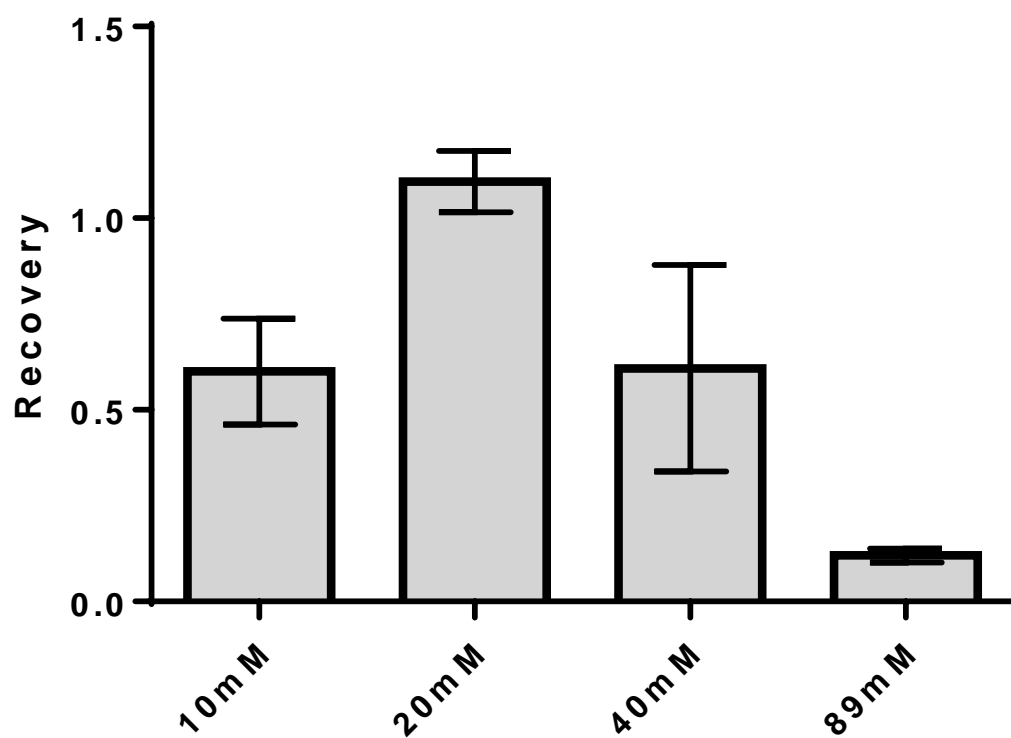


Figure S3. Phosphate buffer (PB) elution at various concentrations (n = 3) to see the effect on DNA detection with qPCR. At 40 mM phosphate and higher, we started to see a decrease in the amount of DNA detected using qPCR.

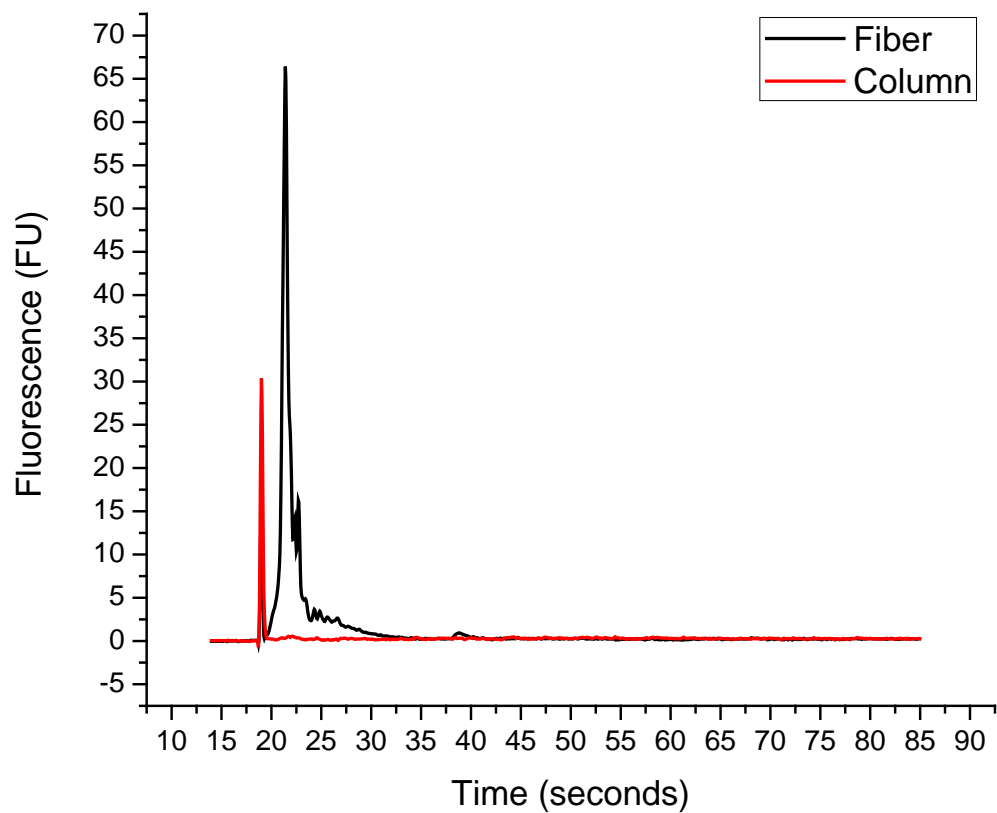


Figure S4. Recovery of total RNA from MDA-MB-231 cells with the fibers and columns using the total RNA Pico chip. The RNA recovered by the fibers was in the lower range, below 1000 nt.