Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information for:

Long term storage of miRNA at room and elevated temperatures in silica sol-gel matrix.

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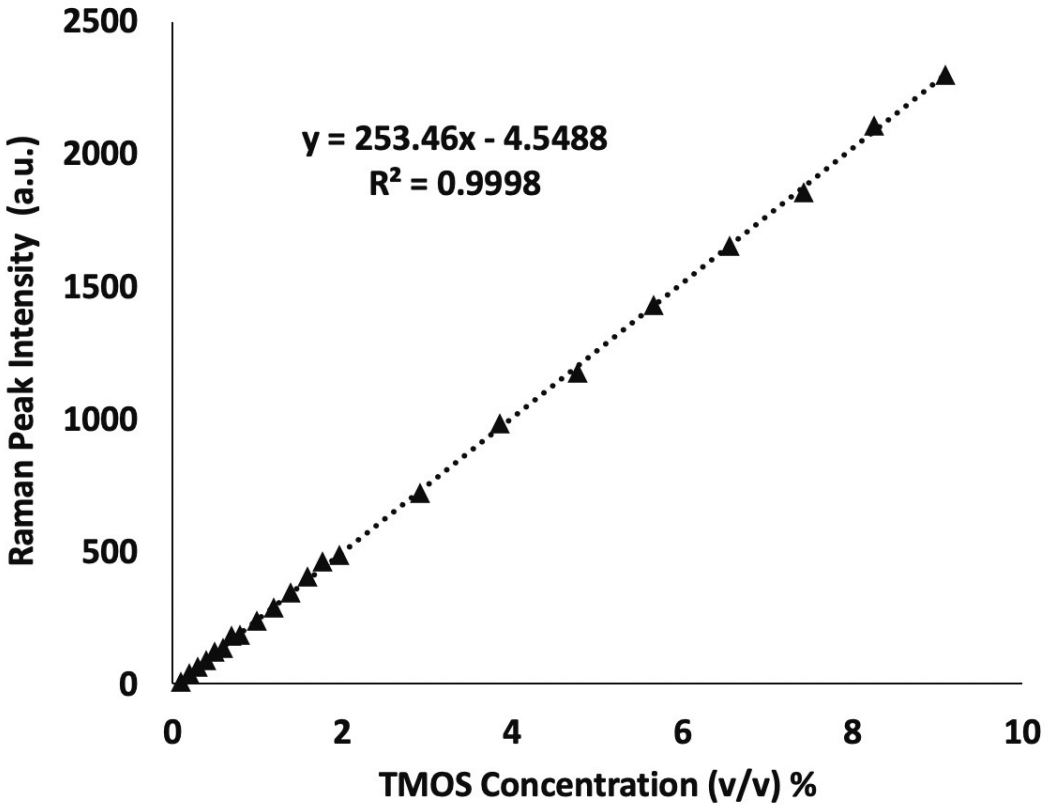

Figure. S1. Calibration Curve of Raman Peak Intensity Vs. TMOS Concentration (v/v) %: A significant increase in the raman peak intensities of methanol is demonstrated with the increase in TMOS concentrations in (0.5 - 10) v/v % range.

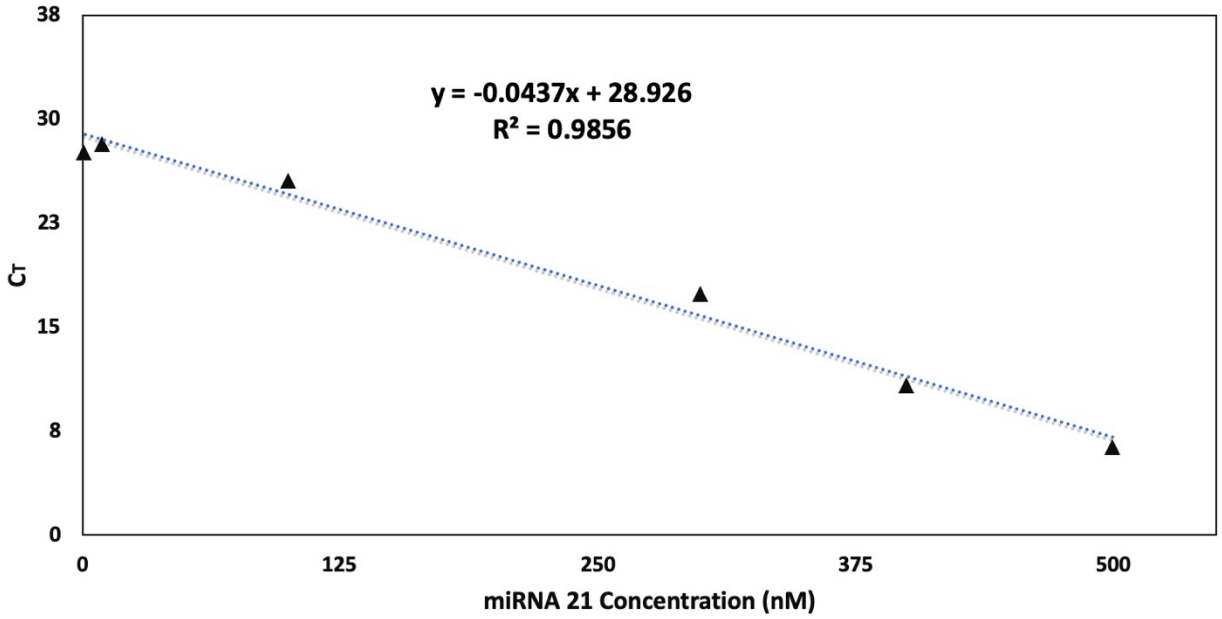

Figure. S2. miRNA 21 concentration (nM) calibration curve in CaRGOS using qRT-PCR analysis: Formulation parameters used were 0.5 v/v % CaRGOS, Low-salt Tris EDTA buffer and nuclease free water.

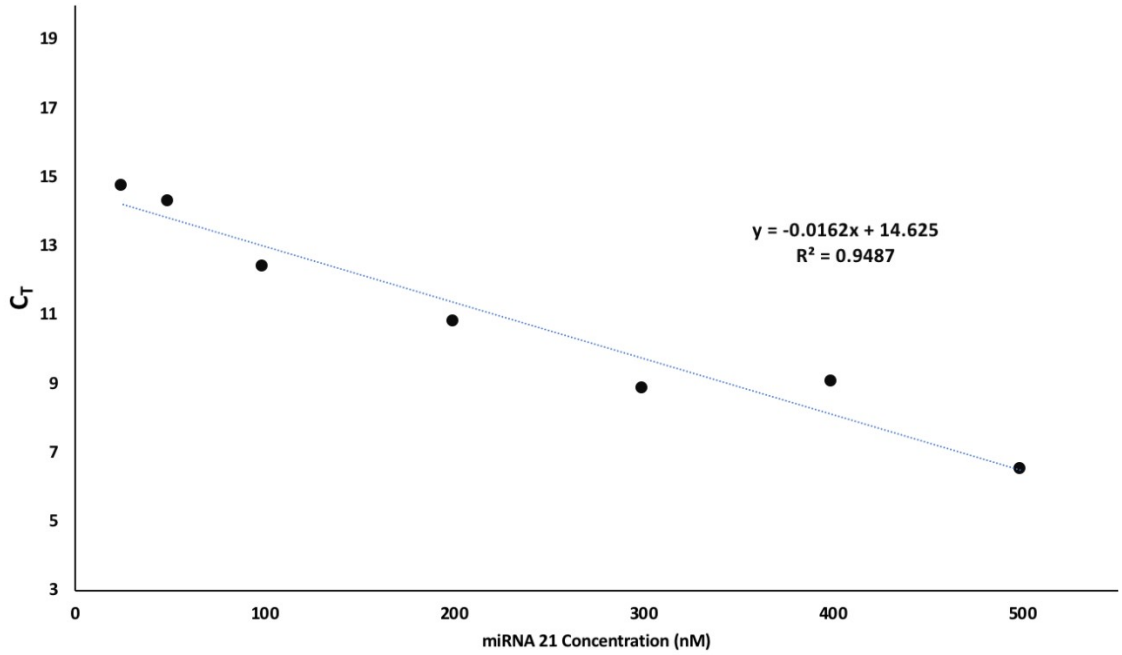

Figure.S3. miRNA 21 concentration (nM) calibration curve in nuclease free water using qRT-PCR analysis: Formulation parameters used were low-salt buffer and nuclease free water.

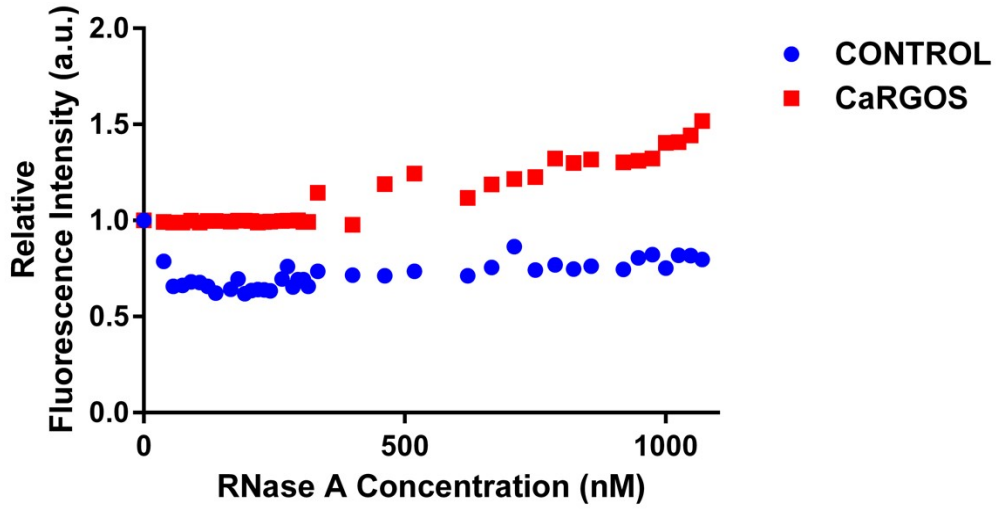

Figure. S4. A plot of relative fluorescence intensity of Ethidium bromide against RNase A concentrations in (0-1200) nM range: An increase in relative fluorescence emission intensities of EtBr was observed in (320-1200) nM RNase A concentrations range.

Table S1

Theoretical and calculated molar methanol yield : Efficiency of the hydrolysis was computed utilizing the Raman peak of methanol aqueous solutions.

TMOS (v/v %)	0.5	1.0	5	10
Theoretical Methanol (mol/L)	0.1353	0.2707	1.3533	2.7066
Calculated Methanol (mol/L)	0.1311	0.2250	1.2519	2.5707
Hydrolysis Efficiency (%)	98.4	83.1	92.5	95.0

Table S2

Methanol content of hydrolyzed TMOS formulations : A significant increase in methanol concentrations is demonstrated with the increase in TMOS concentrations.

TMOS (v/v %)	**Methanol Peak (Counts)**	**Methanol Content (v/v %)**
0.5	191.0	0.74
1.0	235.3	0.91
5.0	1288.2	5.06
10.0	2640.4	10.40

Table S3

Size and stability characterization of CaRGOS formulations : Hydrodynamic Size (DLS), Polydispersity Index (PDI) and Stability [zeta potential (ζ)] characterization of CaRGOS.

Sample	DLS (nm)	PDI	Zeta Potential (mV)
CaRGOS without buffer (1.25 v/v %)	*0.79 ± 0.11	0.983 ± 0.026	-22.07 ± 1.01
CaRGOS without buffer (0.5 v/v %)	**	**	-26.58 ± 7.69
CaRGOS with Buffer (0.5 v/v %)	67.22 ± 1.65	0.248 ± 0.006	-10.50 ± 1.66
CaRGOS with Buffer (0.5 v/v %) *and* miRNA 21	69.95 ± 0.47	0.308 ± 0.004	-20.04 ± 1.26
CaRGOS with Buffer (0.5 v/v %) *without* miRNA 21	70.02 ± 2.09	0.338 ± 0.035	-22.07 ± 1.01

A (~1 nm) Hydrodynamic size is insignificant

****Count-rate too low for measurement***

Table S4:

Reverse Transcription (RT) reaction mixture for a 15 μL reaction : 15 μL reaction consists of 7 μL master mix, 3 μL of 5X primer and 5 μL miRNA 21 sample (with or w/o CaRGOS).	
Component	**Volume (μL) per 15- μL reaction**
100 mM dNTPs	0.15
MultiScribe Reverse Transcriptase, 50 U/ μL	1.00
10X Reverse Transcription Buffer	1.50
RNase Inhibitor 20 U/μL	0.19
Nuclease-free water	4.16
5X miRNA	3.00
Total volume(μL)	10.00

Table S5

PCR reaction mixture for a 10 μL reaction: Each 10 μL reaction consists of 5 μL master mix, 0.5 μL of 20X primer, 3.17μL of nuclease-free water and 1.33μL of cDNA (RT product).	
Component	**Volume (μL) per 10- μL reaction**
20X miRNA Primer	0.5
Universal Master Mix	5.00
Nuclease-free water	3.17
Total Volume	8.67