Supporting Information for:

Chemically Modified Dendritic Starch: A Novel Nanomaterial for siRNA Delivery

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Supplemental Figures and Tables

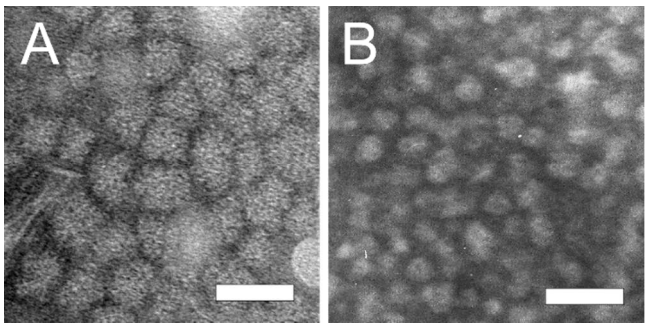
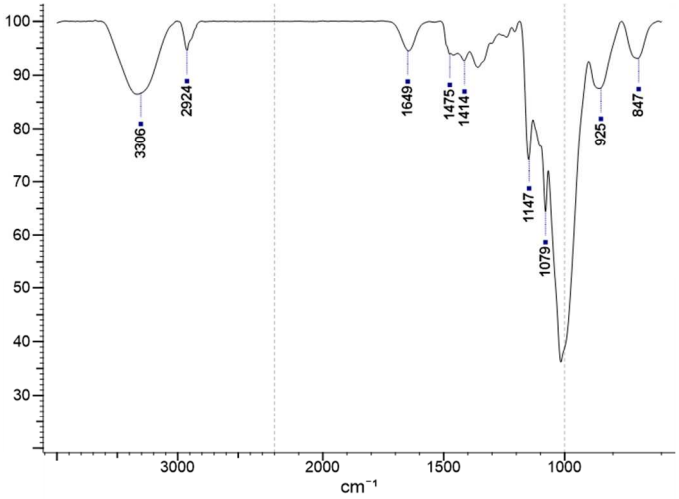


Figure S1. Transmission electron micrographs of unmodified ESG (A) and cESG synthesized at 1:10 ratio ESG:GTMA (B) stained with methylamine tungstate. Scale bar 50nm.



cm^{-1}	Peak assignment for cESG
3306	O-H stretch
2924	C-H stretch
1649	H_2O adsorbed
1475	C-H bend in (CH_3)-N^+
1414	C-H_2 bend, C-O-O stretch
1147	C-O, C-C stretch
1079	C-O-H bending mode
925	α(1→4) glycosidic stretch
847	C1-H, CH2 deformation

Figure S2. Attenuated total reflectance Fourier transform infrared spectroscopy (ATR-FTIR) of cESG synthesized at a 1:10 ratio with peak assignments.

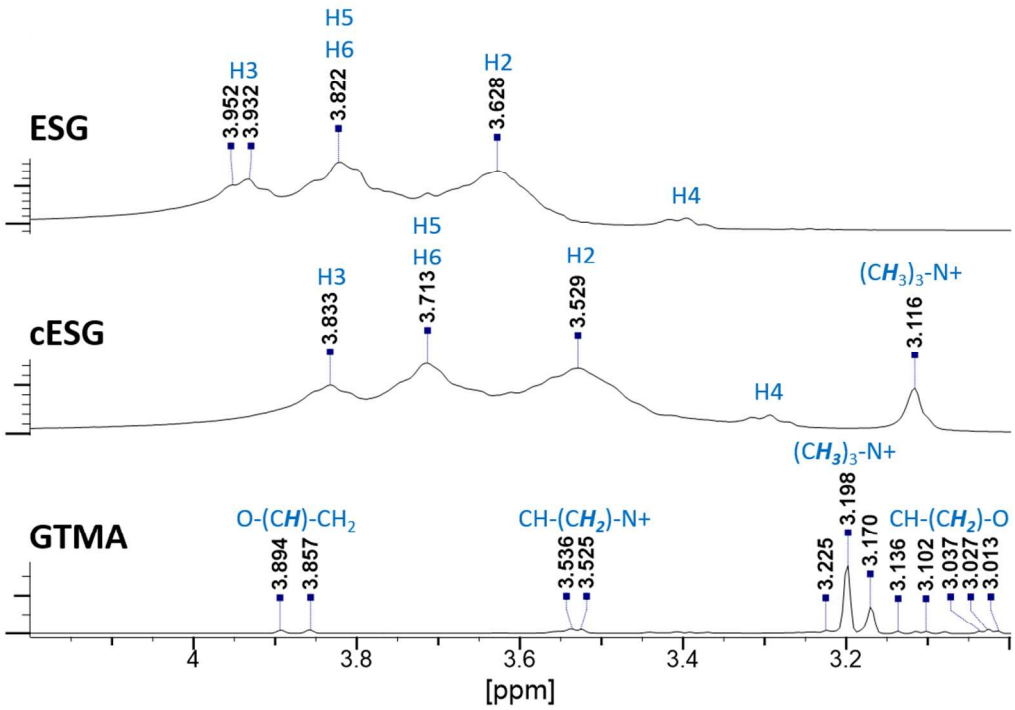


Figure S3. Proton nuclear magnetic resonance (NMR) of cESG indicates incorporation of ammonium group. 400 MHz proton NMR of ESG, cESG, and GTMA in deuterated water with peak assignments. The appearance of peak at 3.116 in cESG corresponds to the 9 hydrogens of $(CH_3)_3$-N+ of the GTMA residue incorporated. Shifts are reported in ppm with peak of proton signal of water at 4.67 used as internal reference.

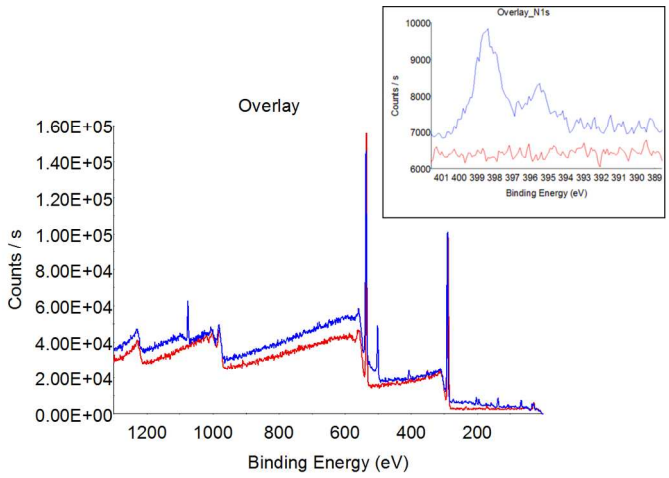


Figure S4. XPS spectrum of unmodified ESG (red) and cESG (blue). Inset Nitrogen high resolution scan.

Table S1. ζ-Potential of cESG-siRNA complexes formed at various ratios cESG to siRNA.[a] Measurements were conducted in 1mM sodium phosphate buffer pH 7.5. Results were averaged over three measurements, each consisting of 60 scans.

Calculated siRNA per cESG	ζ-Potential ± Standard Deviation (mV)
4	2.53 ± 17.8
8	2.62 ± 17.9
20	2.07 ± 17.7
40	1.57 ± 18.0
200	3.41 ± 18.0
495	-0.79 ± 17.6
1238	-5.78 ± 17.9
5940	5.99 ± 16.9

[a]siRNA concentration was held constant for all reactions.

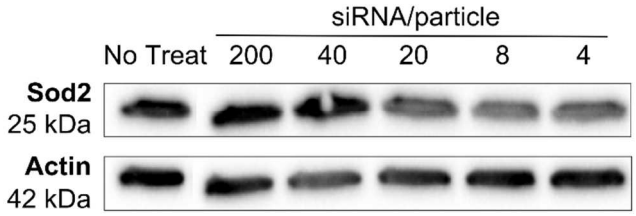


Figure S5. Representative western blot of Sod2 protein expression 72 hrs after treatment with cESG-siRNA complexes of various ratios.

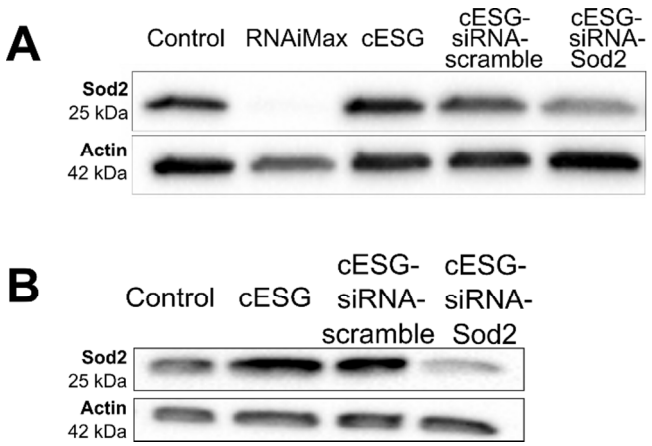


Figure S6. cESG-siRNA facilitates sustained protein expression knockdown. Representative western blot of ES-2 cells were treated either with growth media (untreated control), cESG, cESG-siRNA-scramble, or cESG-siRNA-Sod2 for 72 hrs (A) or allowed to recover in normal media for an additional 72hrs (B) prior to assessment of Sod2 protein expression.