Electronic Supplementary file (ES1)

Synthesis of carboxy methylated guargum grafted polyethyleneimine copolymer as an efficient gene delivery vehicle

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Scanning electron microscopic measurement

About 10 µL of polyplex suspension was deposited on to a glass cover slip. After drying at room temperature, the morphology of the polyplexes was observed by SEM (Hitachi, Japan, Model-3400N). Before the SEM observation, the samples were fixed on an aluminum stub and coated with gold by ion sputter coater (Hitachi, Japan, Model-E1010) for 7 min.

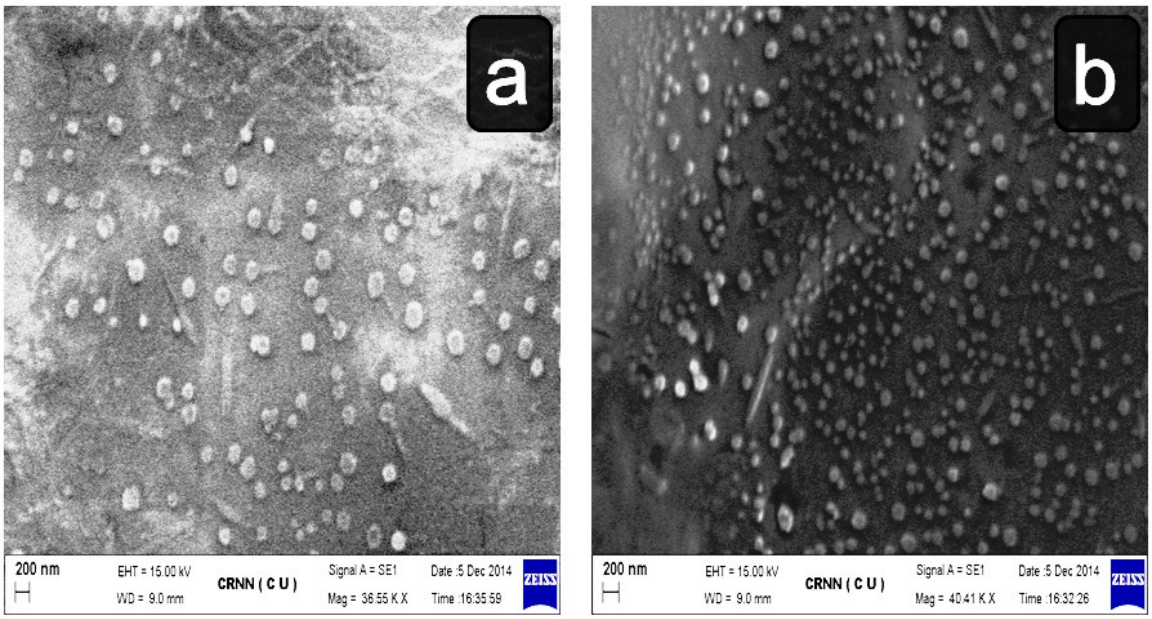

Fig. S1SEM images of CMGG-g-PEI/pDNA complex at weight ratio of (a) 10:1and (b) 30:1.CMGG-g-PEI/pDNA complexes were prepared in 25 mM sodium acetate buffer (pH 5.5) containing 1 µg of pDNA.

Atomic force microscopic (AFM) measurement

The size and morphology of polyplexes were also characterized by AFM (Nanoscope IV Bioscopet, Digital Instruments, Veeco). Sample was prepared as per SEM sample preparation onto the center of a fresh mica disk. The imaging was conducted in tapping mode and at a scan speed of 1 Hz at ambient condition.

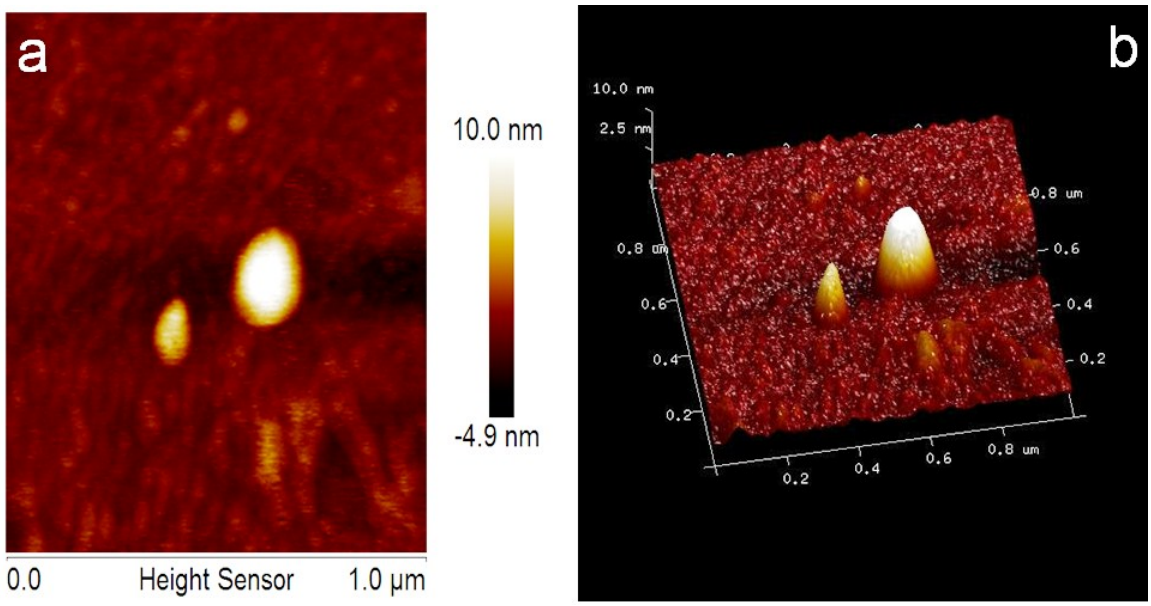

Fig.S2 (a) AFM height image of CMGG-g-PEI/pDNA complex at weight ratio of 30:1.The complex was prepared in 25 mM sodium acetate buffer (pH 5.5) containing 1µg of pDNA, (b) three-dimensional image of selected area in image.

***In vitro* enzymatic degradation**

Methods:

The degradation behavior of guar gum (GG) and CMGG-g-PEI were studied at pH 8.0 in Tris HCl buffer solution at 37°C with 5% CO_2. GG and CMGG-g-PEI (50 mg) were incubated in 10 ml glass vial with 15 µl Tris HCl buffer containing endo-1-4-β mannanase solution (50 U ml^{-1}) and stirred on a shaker at 37°C for 10 min. The degradation of the film was monitored in every 24 hrs time interval and the time to complete dissolution of the film was noted.