Electronic Supplementary Material (ESI) for Biomaterials Science.

Electronic Supplementary information

Target delivery of microRNA-126 to vascular endothelial cells *via* REDV peptide-modified PEG-trimethyl chitosan

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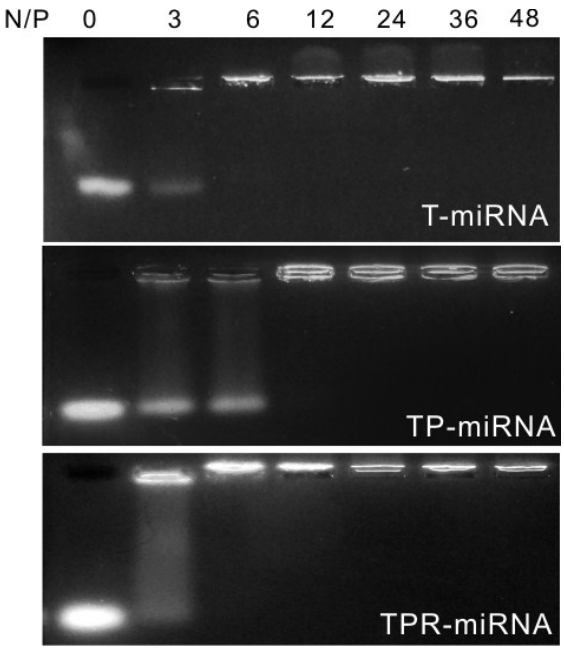

Fig. S 1 Agarose gel electrophoresis of T-miRNA, TP-miRNA and TPR-miRNA complexes at different N/P molar ratios.

The binding capacity of miRNA with polyplexes was evaluated by gel retardation assay. As shown in Fig. S1, the migrations of miRNA in agarose gel were completely retarded when the N/P molar ratio was greater than 6 for T-miRNA and 12 for TP-miRNA and TPR-miRNA, respectively. It was suggested that TMC, TMC-g-PEG and TMC-*g*-PEG-REDV could effectively combine and compact miRNA into relatively stable complexes at an N/P molar ratio equal or greater than 6, 12 and 12, respectively.

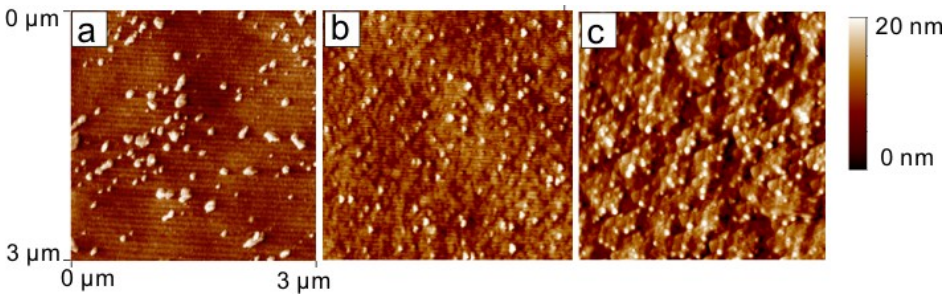

Fig. S2 AFM topography images of T-miRNA (a), TP-miRNA (b), and TPR-miRNA (c) complexes.

The morphology of polyplex/miRNA complexes at N/P=12 was investigated by AFM. Samples were imaged at 3 μm×3 μm magnifications using a nanosensor silicon tip. In the AFM topography images**,** the diameters of the complexes were about 94±6.6 nm, 54±2.7 nm and 55±2.5 nm, respectively. TPR-miRNA and T-miRNA had a smaller diameter than T-miRNA, consistent with the size measured by TEM.

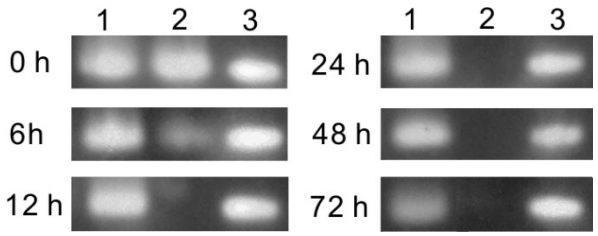

Fig. S3 miRNA serum stability. Lane 1: TPR-miRNA; Lane 2: naked miRNA; Lane 3: intact miRNA.

The miRNA protection effect of TPR polyplex in TPR-miRNA was monitored by 50 % serum stability assay with intact miRNA as a positive control (Lane 3). As shown in Fig. S3, naked miRNA displayed faint bands after 6 h and was fully degraded after 24 h (Lane 2), suggesting that naked miRNA was prone to degradation in serum. In contrast, the degradation of the miRNA recovered from TPR-miRNA complexes started after 24 h, but complete degradation was not observed even after 72 h.