Electronic Supplementary Information (ESI)

Enhanced gene transfection ability of sulfonylated low molecular weight PEI and its application in anti-tumor treatment

Xiao-Li Tian, Ping Chen, Yue Hu, Lan Zhang, Xiao-Qi Yu and Ji Zhang*

Key Laboratory of Green Chemistry and Technology (Ministry of Education), College of Chemistry, Sichuan University, Chengdu 610064, P. R. China

*Corresponding author: jzhang@scu.edu.cn.

Table S1. The composition of **Ts-P**.

Name	Feeding mass ratio (TsCl / PEI 1.8 kDa)	Feeding mole ratio (TsCl / amines in PEI)	Substitution degree (SD) [a]
Ts-P-0.3	0.3	6.8%	6.0%
Ts-P-0.5	0.5	11.3%	10.6%
Ts-P-0.8	0.8	18.0%	18.2%
Ts-P-1.0	1.0	22.6%	22.0%

a. Substitution percentage relative to all amine groups on PEI, calculated based on ^{1}H NMR spectra.

Table 2. The miLogP of **R-P**.

编号	miLogP
Bs-P	1.31
Ts-P	1.76
Fs-P	2.02
Ns-P	2.49
Bz-P	1.43

Calculated by Molinspiration software

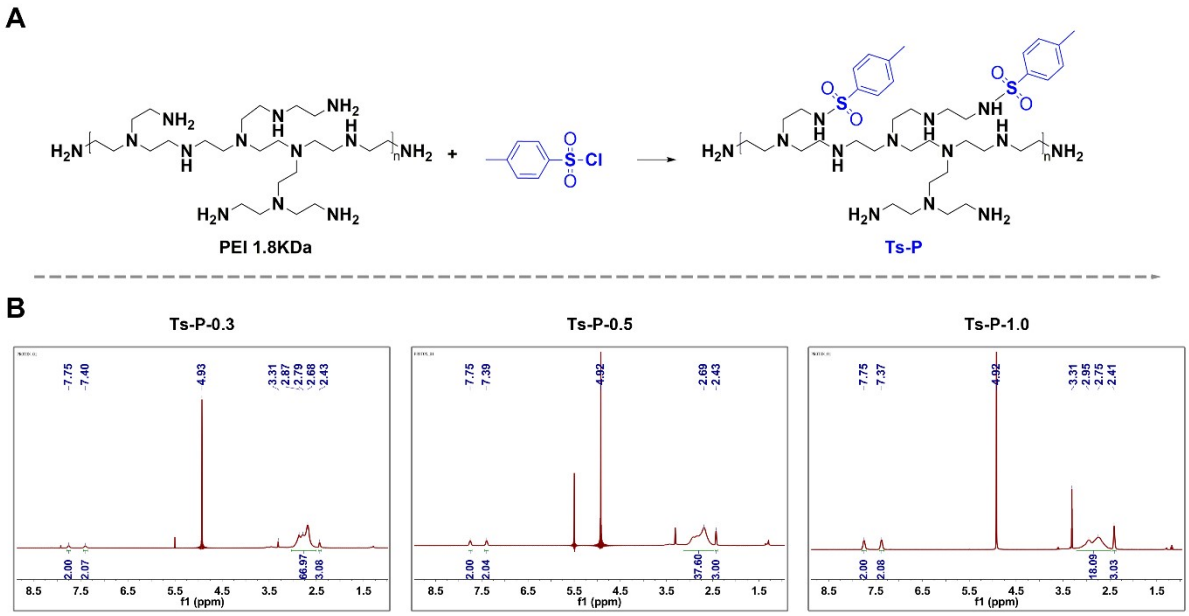

Fig. S1. (A) Tosylation of LMW PEI. (B) ^{1}H NMR spectra of **Ts-P-0.3**, **Ts-P-0.5**, **Ts-P-1.0**.

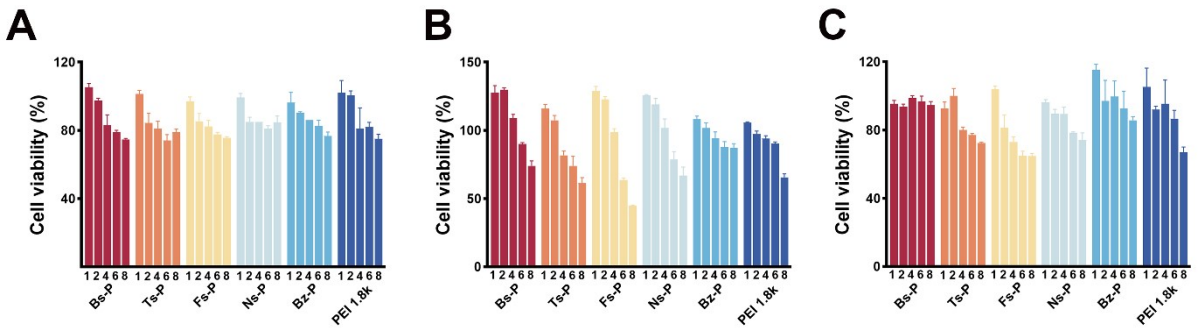

Fig. S2. Cell viability after treatment with polyplexes at different w/w for 24 h in B16 (A), 7702 (B) and HeLa cells (C).

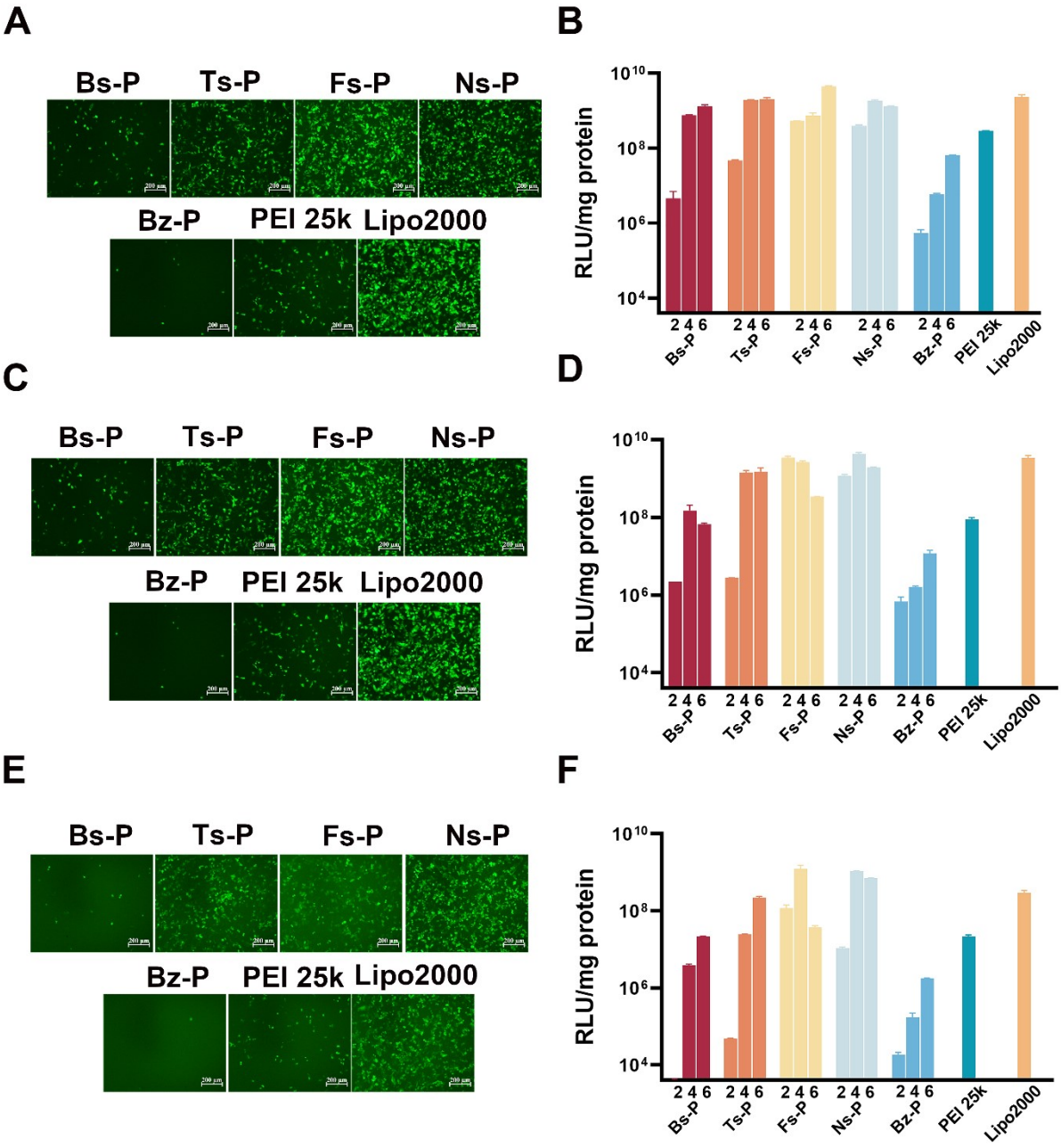

Fig. S3. (A & C & E) EGFP expression images after **R-P**/pEGFP transfection to B16 (A), 7702 (C) and HeLa cells (E), **R-P**/pEGFP complexes were used under the optimal w/w ratio (4 in B16 and HeLa, 2 in 7702). (B & D & F) pGL-3 expression results mediated by **R-P**/pGL-3 complexes in B16 (B), 7702 (D) and HeLa (F) cells. PEI 25kDa and Lipo 2000 was used as control.

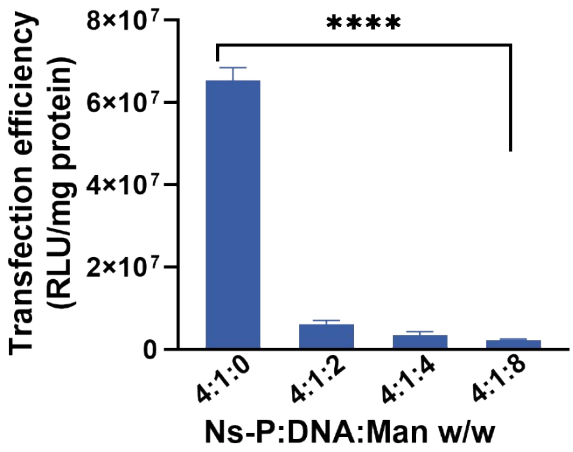

Fig. S4. Effect of crosslinked mannan on the transfection efficiency of **Ns-P**/pGL-3 polyplexes in HepG2 cells.

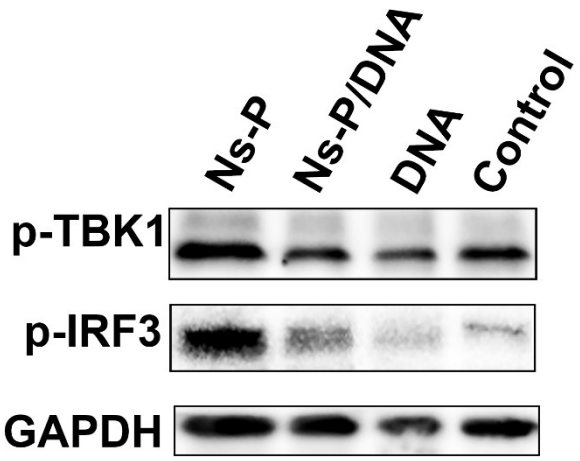

Fig. S5. Western blot analysis of the STING pathway activation in DC2.4 cells.

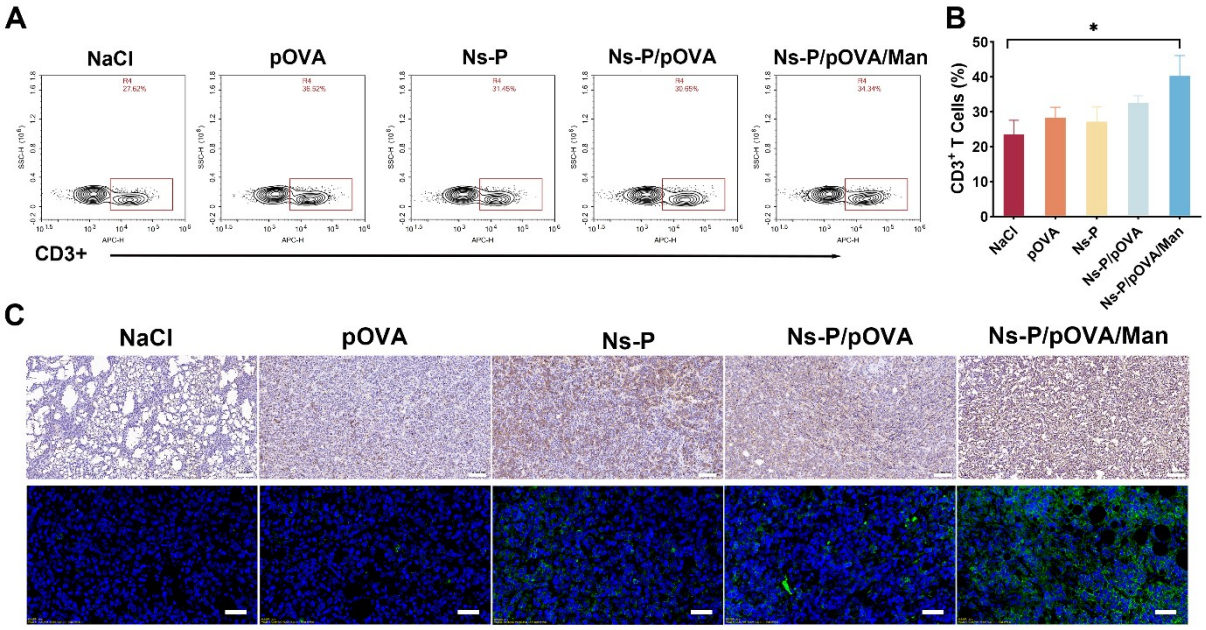

Fig. S6. (A & B) Flow cytometry and statistical results of the percentage of $CD3^+$ T cells in tumor. (C) Representative immunohistochemistry images of $CD4^+$ cells (brown) and the cell nuclei (purple) in tumor slices after different treatments, scale bar: 100 μm (above); Immunofluorescence images of $CD4^+$ T cells (green) and cells nuclei (blue) in tumor slices after different treatments, scale bar: 50 μm (below).

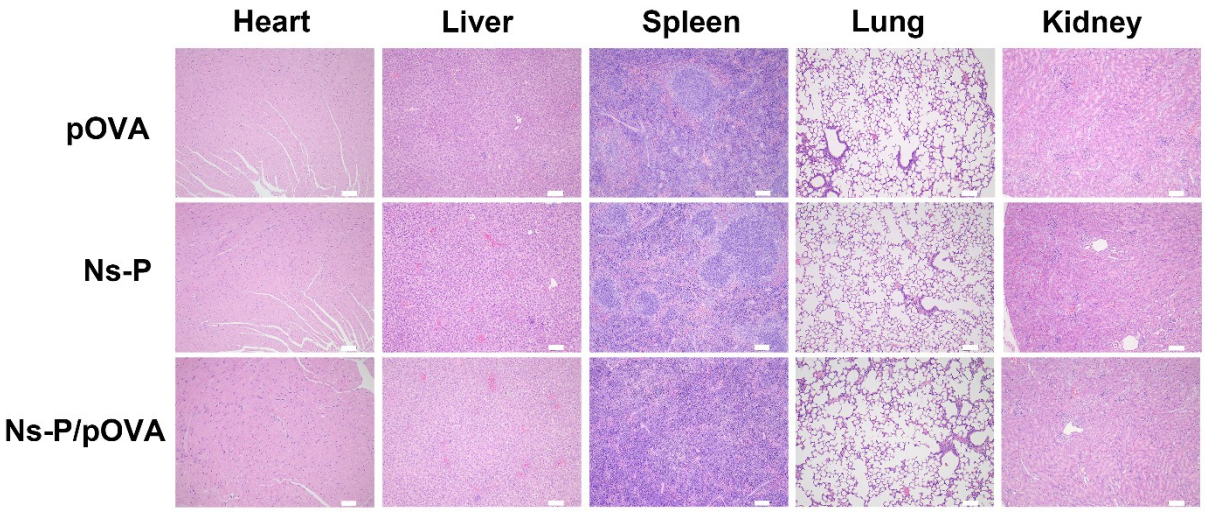

Fig. S7. The H & E staining results of major organs from mice after different treatments, scale bar: 100 nm.