

*Supplementary Information for*

**2-Aminoimidazole : A Multifunctional Group Achieving Excellent  
Gene Transfection Efficacy**

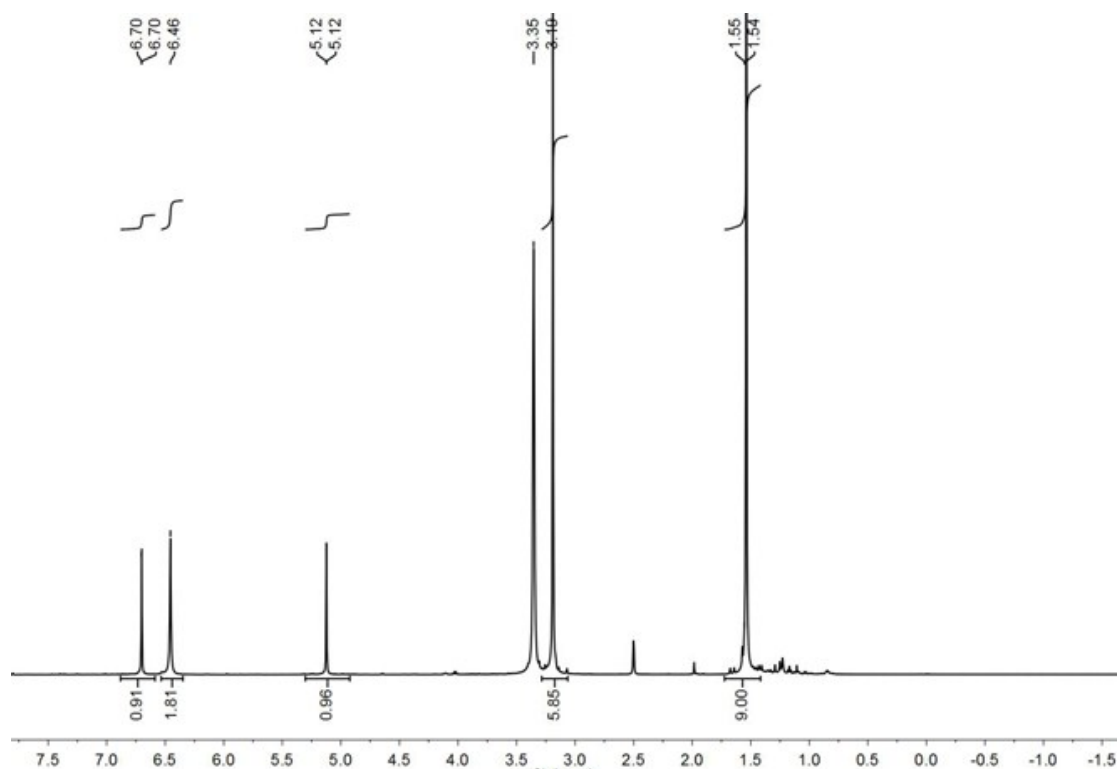
Jing Wang,<sup>a</sup> Xuefeng Hu,<sup>a</sup> Dongli Wang,<sup>a</sup> Cao Xie,<sup>a</sup> Weiyue Lu,<sup>a</sup> Jie Song,<sup>a</sup> Ruifeng Wang,<sup>a</sup> Chunli Gao,<sup>b</sup> and Min Liu<sup>\*a</sup>

<sup>a</sup>Department of Pharmaceutics, School of Pharmacy Fudan University & Key Laboratory of Smart Drug Delivery (Fudan University), Ministry of Education Shanghai, 201203 (P.R. China)

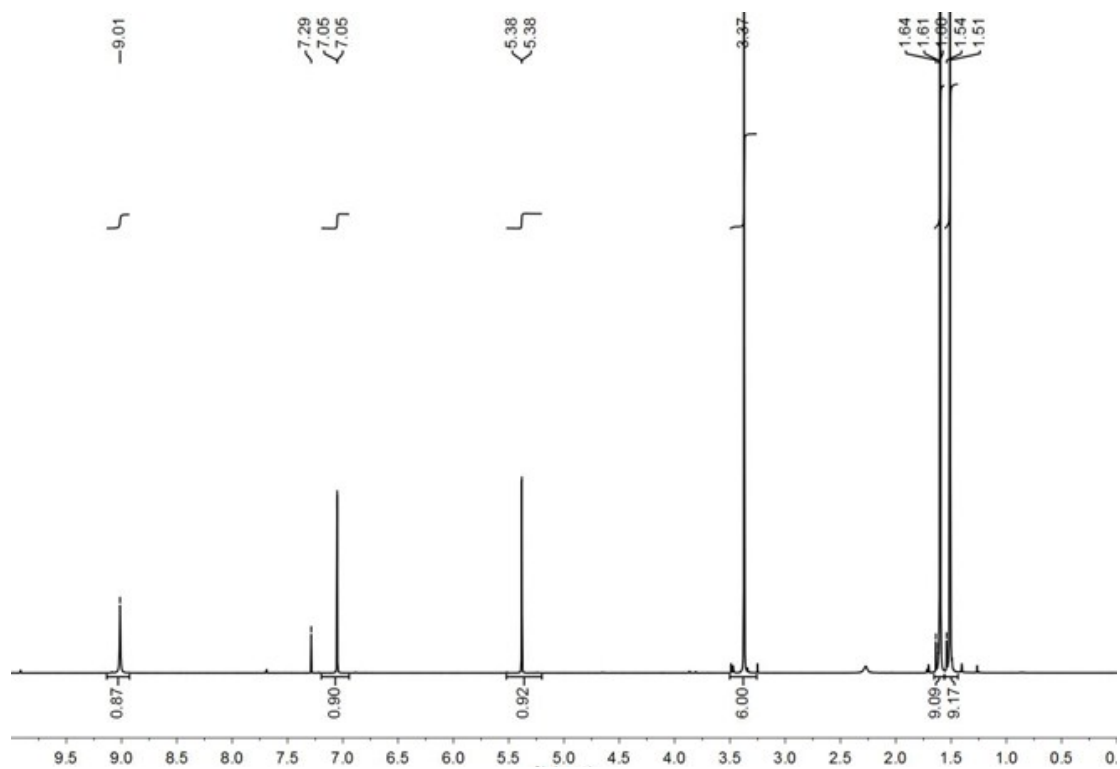
<sup>b</sup>Department of Otolaryngology-Head and Neck Surgery, Eye and ENT Hospital, Fudan University\*

\*E-mail: liumin@shmu.edu.cn.

## 1. NMR data



*Fig. S1.* <sup>1</sup>H NMR spectrum of compound 2. <sup>1</sup>H-NMR (600 MHz, DMSO-d<sub>6</sub>):  $\delta$ =1.54 (9H, s, -Boc), 3.19 (6H, s, CH<sub>3</sub>O), 5.12 (1H, s, CH), 6.46 (2H, s, -NH<sub>2</sub>), 6.70 (1H, s, =CH) ppm



*Fig. S2.* <sup>1</sup>H NMR spectrum of compound 3. <sup>1</sup>H-NMR (600 MHz, CDCl<sub>3</sub>):  
 $\delta$ =1.51 (9H, s, -Boc), 1.61 (9H, s, -Boc), 3.37 (6H, s, CH<sub>3</sub>O), 5.38 (1H, s, CH),  
7.05(1H, s, =CH), 9.01 (1H, s, -NH-) ppm

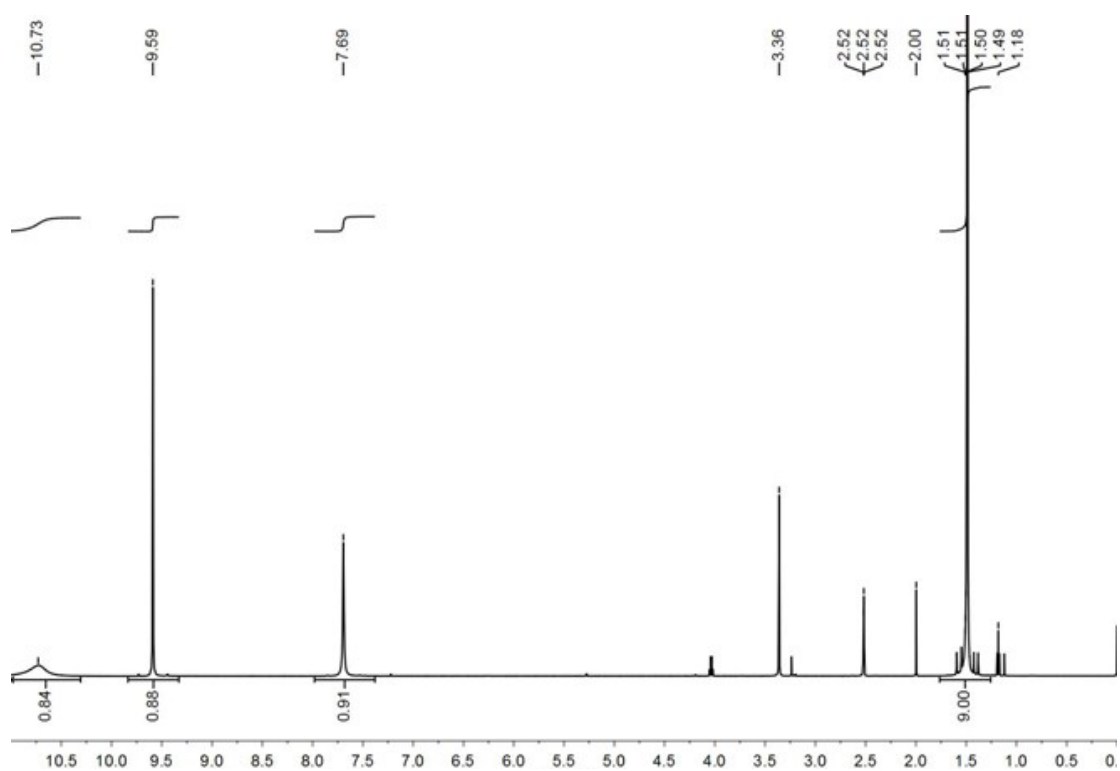
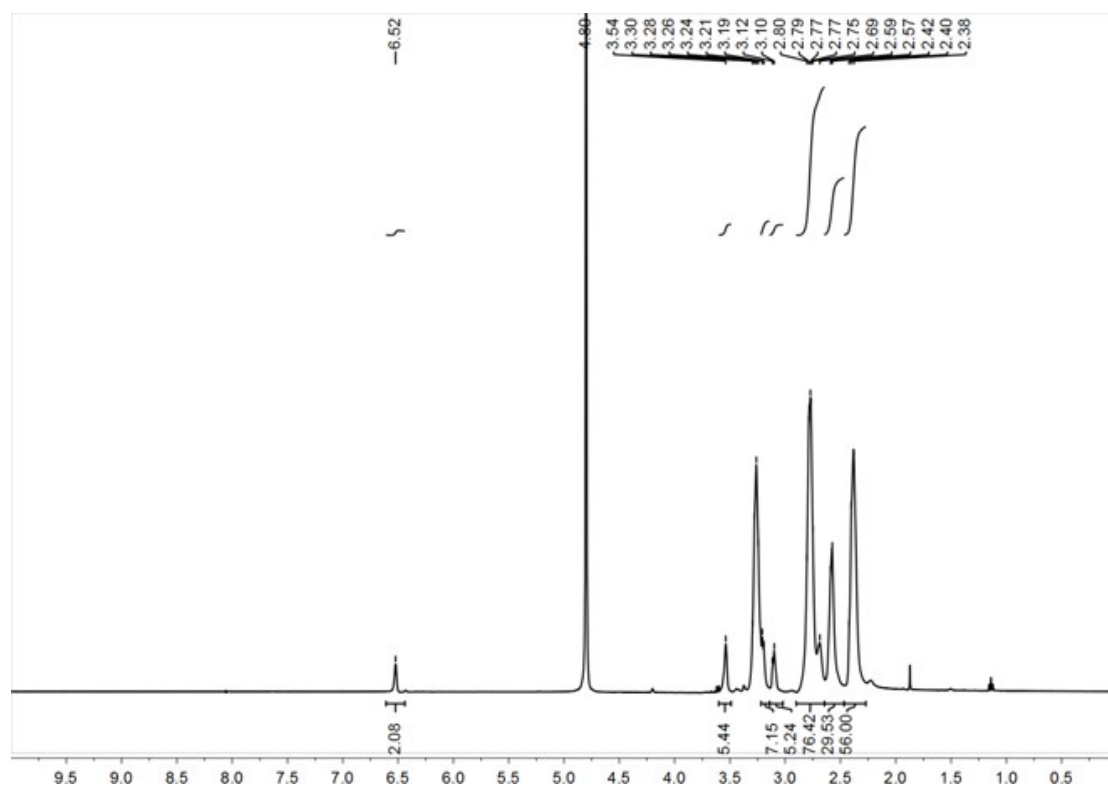


Fig. S3. <sup>1</sup>H NMR spectrum of compound 4. <sup>1</sup>H-NMR (600 MHz, DMSO-d<sub>6</sub>): δ=1.50 (9H, s, -Boc), 7.69 (1H, s, =CH), 9.59(1H, s, -CHO), 10.73 (1H, s, -NH-) ppm



*Fig. S4.*  $^1\text{H}$  NMR spectrum of G2-AM-2.  $^1\text{H}$ -NMR (400 MHz,  $\text{D}_2\text{O}$ ):  $\delta=6.52$  (2H, s, Imidazole), 3.54 (4H, s,  $-\text{NH}-\text{CH}_2-$ ), 3.30-3.10 (54H, m,  $-\text{NH}-\text{CH}_2-$ ), 2.80-2.40 (100H, m,  $-\text{CH}_2\text{CH}_2-$ ), 2.38 (56H, s,  $-\text{CH}_2\text{CO}-$ ) ppm

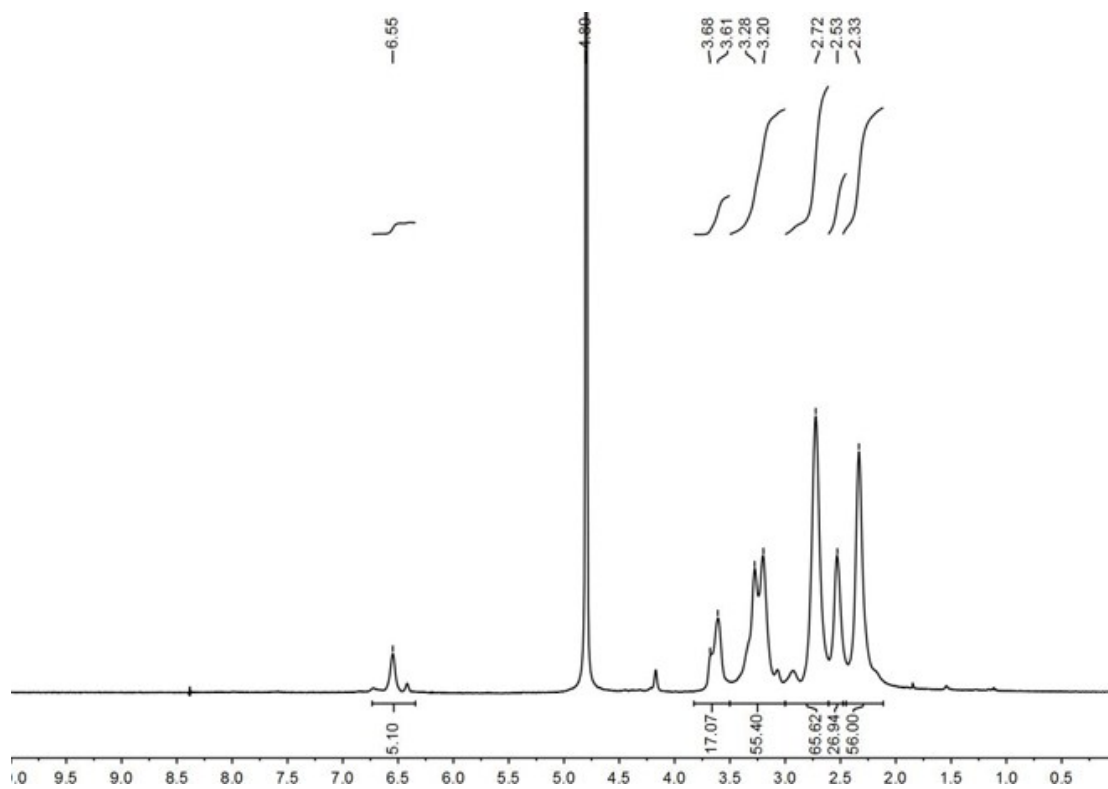
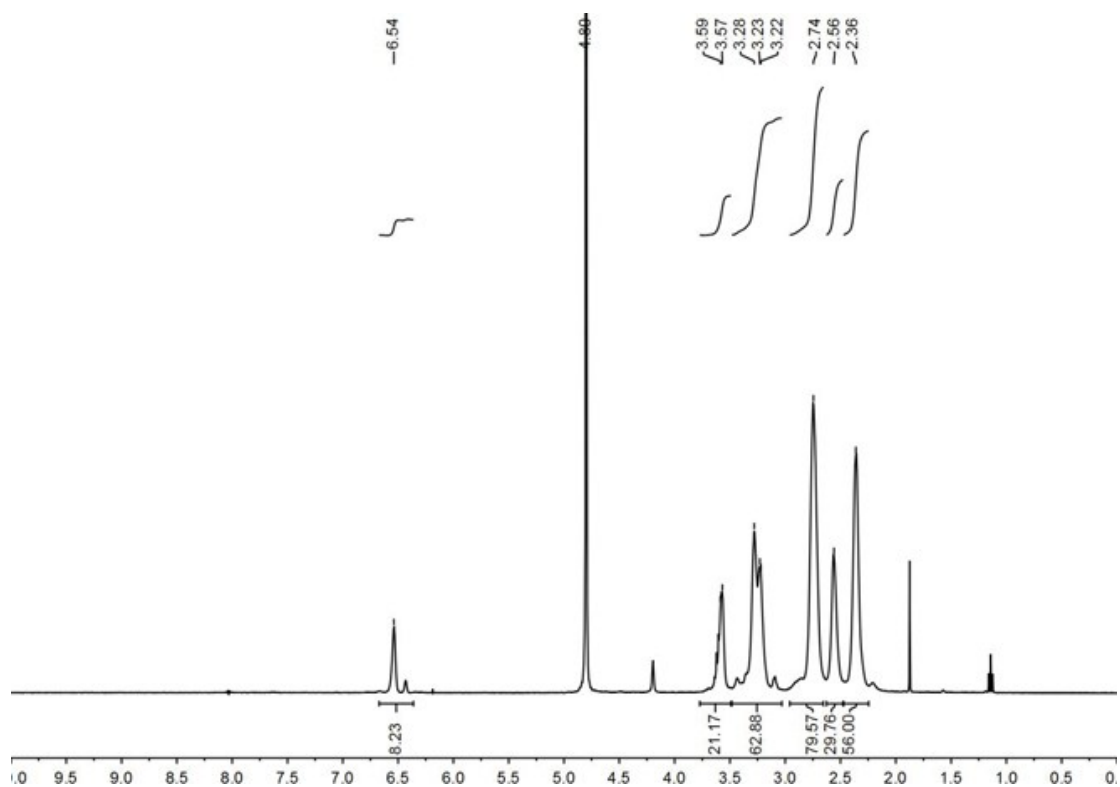
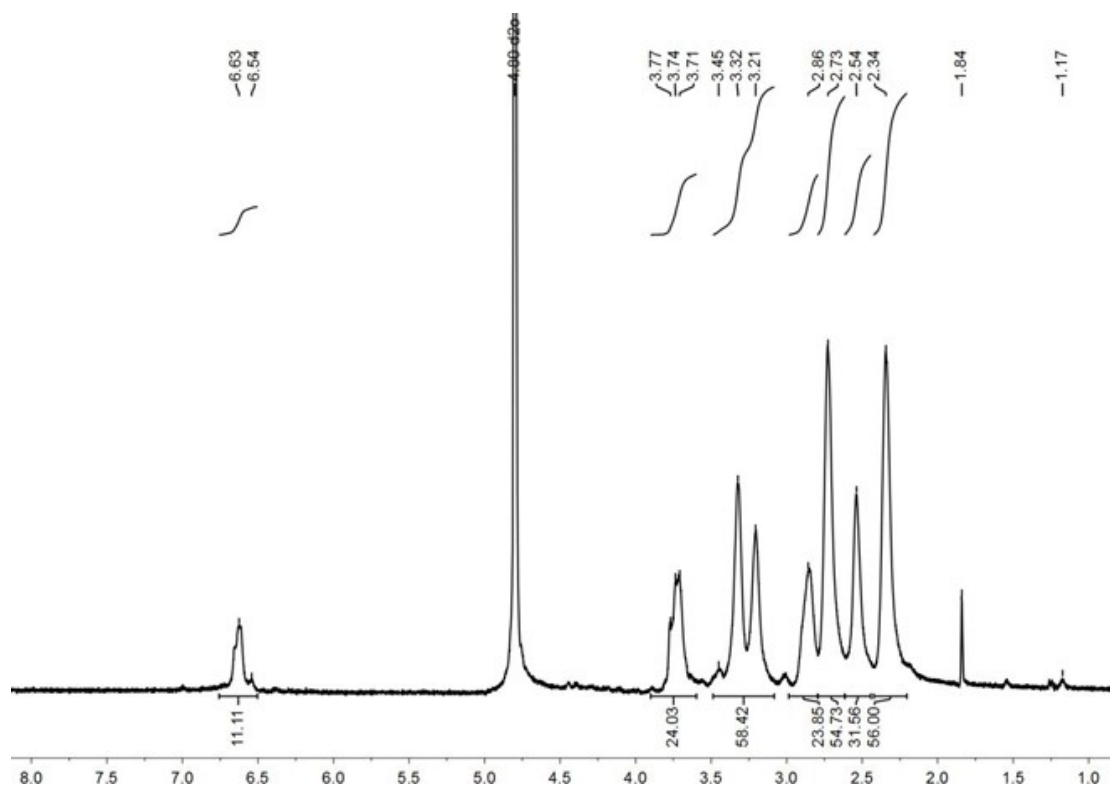


Fig. S5.  $^1\text{H}$  NMR spectrum of G2-AM-5.  $^1\text{H}$ -NMR (400 MHz,  $\text{D}_2\text{O}$ ):  $\delta=6.55$  (5H, s, Imidazole), 3.68-3.61 (18H, s,  $-\text{NH}-\text{CH}_2-$ ), 3.28-3.20 (56H, m,  $-\text{NH}-\text{CH}_2-$ ), 2.72-2.53 (100H, m,  $-\text{CH}_2\text{CH}_2-$ ), 2.33 (56H, s,  $-\text{CH}_2\text{CO}-$ ) ppm

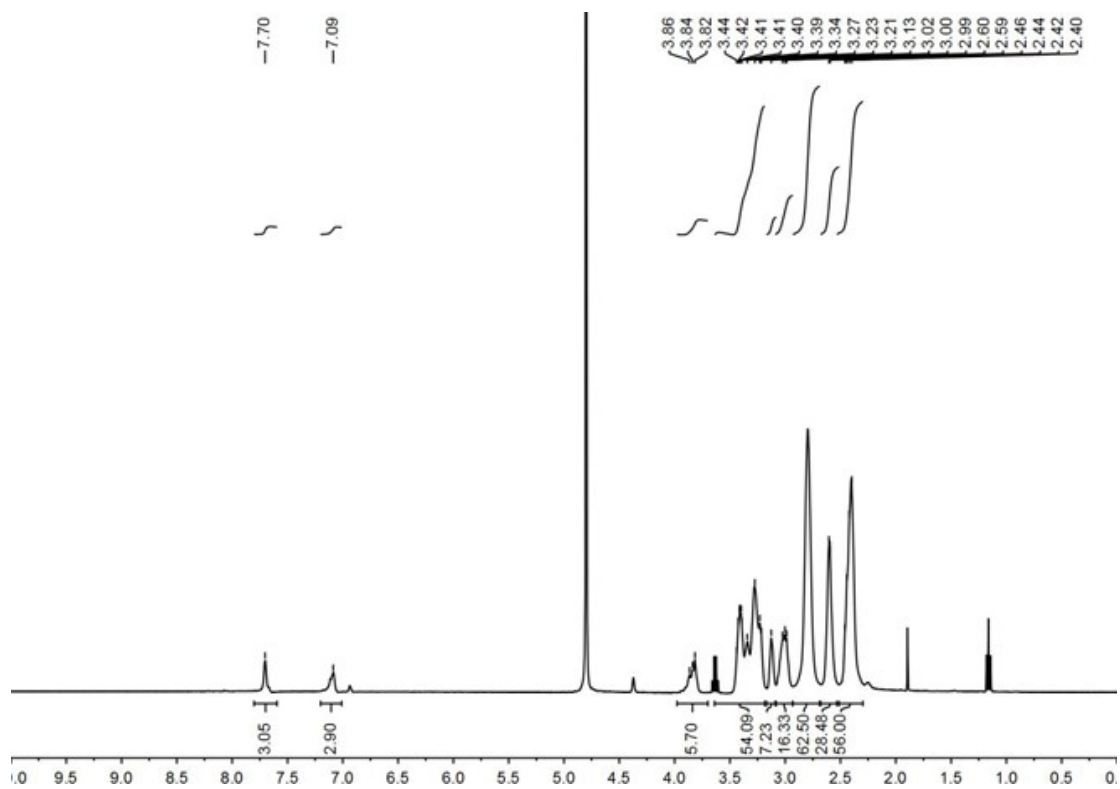


*Fig. S6.*  $^1\text{H}$  NMR spectrum of G2-AM-8.  $^1\text{H}$ -NMR (400 MHz,  $\text{D}_2\text{O}$ ):  $\delta=6.54$  (8H, s, Imidazole), 3.59-3.57 (20H, s, -NH- $\text{CH}_2$ -), 3.28-3.22 (50H, m, -NH- $\text{CH}_2$ -), 2.74-2.56 (110H, m, - $\text{CH}_2\text{CH}_2$ -), 2.15 (56H, s, - $\text{CH}_2\text{CO}$ -) ppm

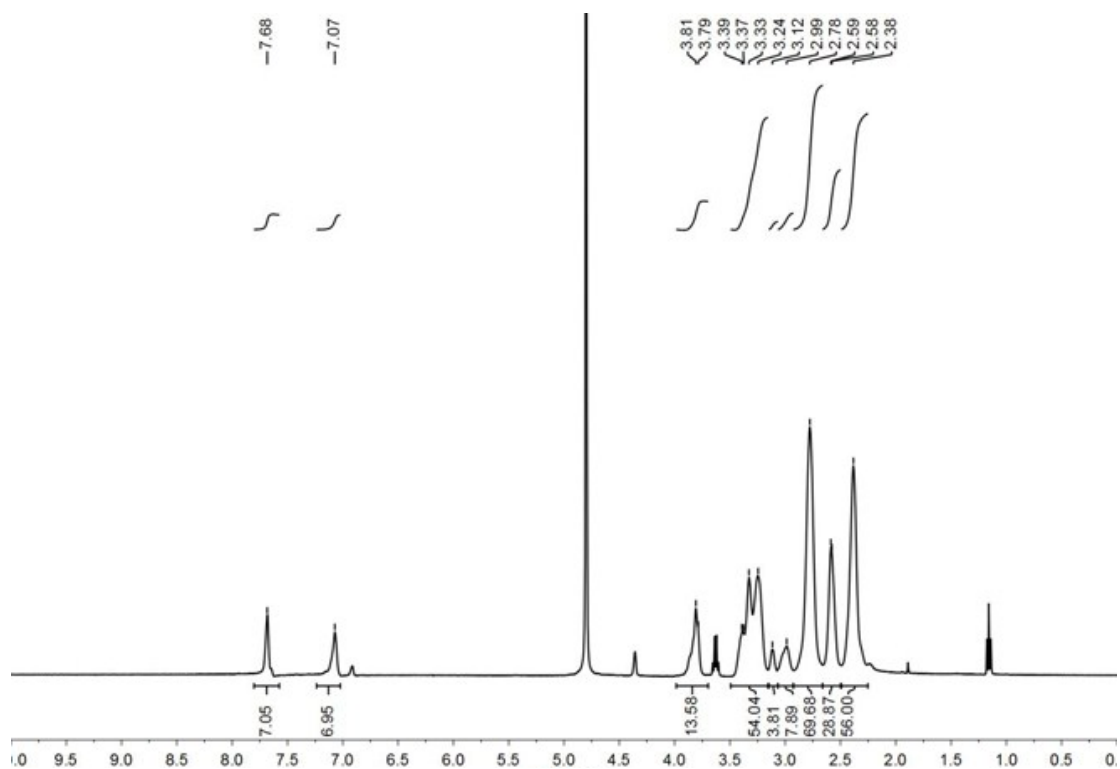


*Fig. S7.*  $^1\text{H}$  NMR spectrum of G2-AM-11.  $^1\text{H}$ -NMR (400 MHz,  $\text{D}_2\text{O}$ ):  $\delta=6.63$  (11H, s, Imidazole), 3.77-3.71 (22H, s, -NH- $\text{CH}_2$ -), 3.33-3.20 (50H, m, -NH- $\text{CH}_2$ -), 2.86-2.54 (100H, m, - $\text{CH}_2\text{CH}_2$ -), 2.34 (56H, s, - $\text{CH}_2\text{CO}$ -) ppm

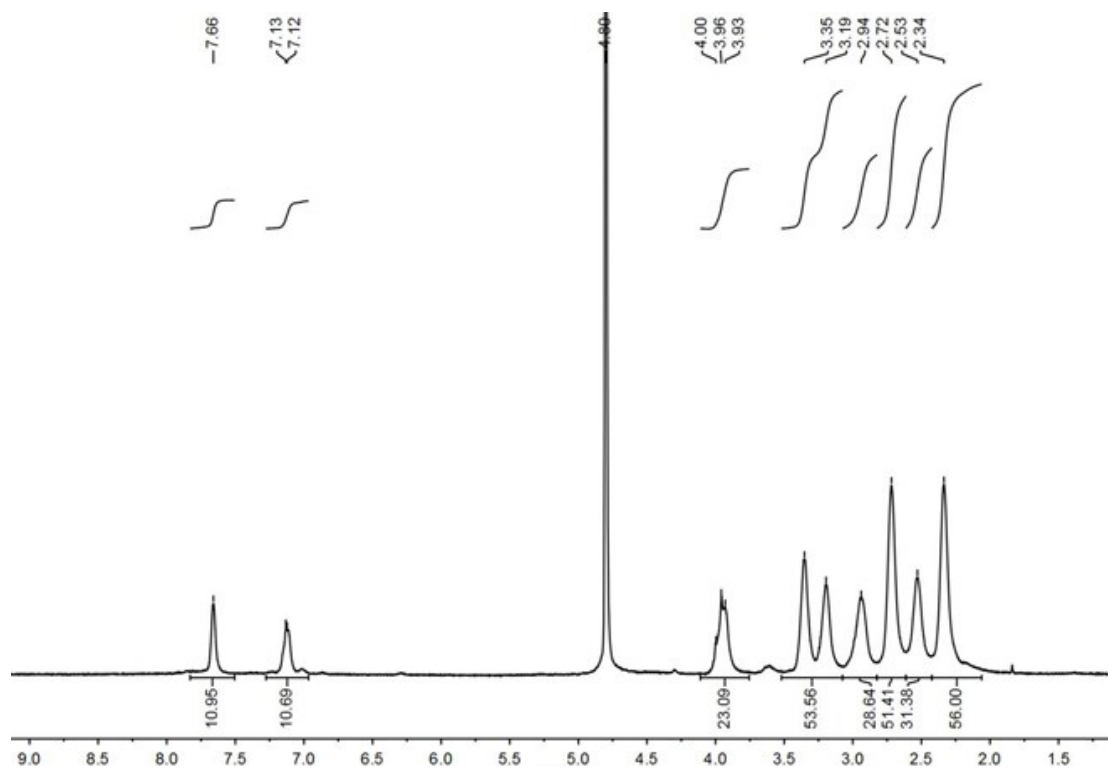




*Fig. S8.*  $^1\text{H}$  NMR spectrum of G2-M-3.  $^1\text{H}$ -NMR (400 MHz,  $\text{D}_2\text{O}$ ):  $\delta=7.70(3\text{H}, \text{s}, \text{Imidazole}), 7.09(3\text{H}, \text{s}, \text{Imidazole}), 3.86-3.82(6\text{H}, \text{s}, -\text{NH}-\text{CH}_2-), 3.44-3.27(53\text{H}, \text{m}, -\text{NH}-\text{CH}_2-), 3.23-2.99(23\text{H}, \text{m}, -\text{NH}-\text{CH}_2-), 2.81-2.79(88\text{H}, \text{m}, -\text{CH}_2\text{CH}_2-), 2.40(56\text{H}, \text{s}, -\text{CH}_2\text{CO-})$  ppm

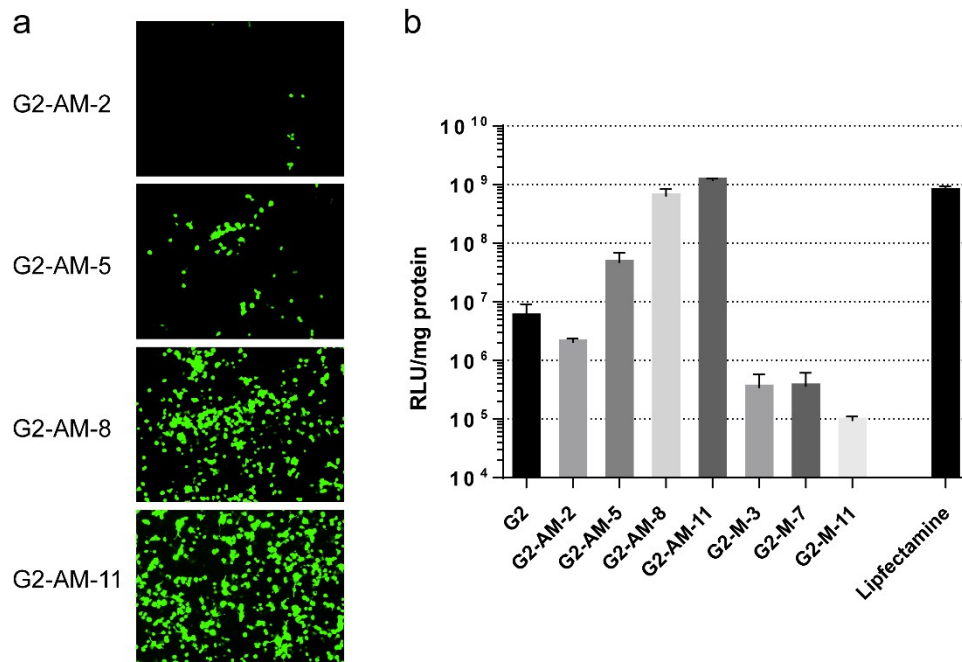


*Fig. S9.*  $^1\text{H}$  NMR spectrum of G2-M-7.  $^1\text{H}$ -NMR (400 MHz,  $\text{D}_2\text{O}$ ):  $\delta=7.68$  (7H, s, Imidazole), 7.07 (7H, s, Imidazole), 3.86 (14H, s, -NH- $\text{CH}_2$ -), 3.40-3.25 (60H, m, -NH- $\text{CH}_2$ -), 3.12-3.10 (14H, m, -NH- $\text{CH}_2$ -), 2.99-2.58 (100H, m, - $\text{CH}_2\text{CH}_2$ -), 2.39 (56H, s, - $\text{CH}_2\text{CO}$ -) ppm

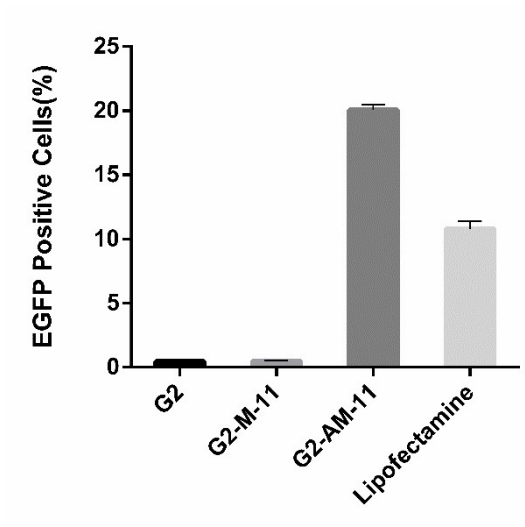


*Fig. S10.* <sup>1</sup>H NMR spectrum of G2-M-11. <sup>1</sup>H-NMR (400 MHz, D<sub>2</sub>O): δ=7.68 (11H, s, Imidazole), 7.09 (11H, s, Imidazole), 3.90-3.81 (24H, s, -NH-CH<sub>2</sub>-), 3.36-3.23 (60H, m, -NH-CH<sub>2</sub>-), 2.88-2.54 (114H, m, -CH<sub>2</sub>CH<sub>2</sub>-), 2.38 (56H, s, -CH<sub>2</sub>CO-) ppm

## 2. Biological studies



*Fig. S11.* Transfection studies in HEK 293T cells. (a) EGFP images, mass ratios were fixed at 12:1. (b) Luciferase activities, mass ratios were fixed at 12:1 Lipofectamine/pDNA. Lipofectamine was used at the recommended concentration.



*Fig. S12.* Transfection studies in HeLa cells. Data are EGFP Positive Cells measured by flow cytometry.

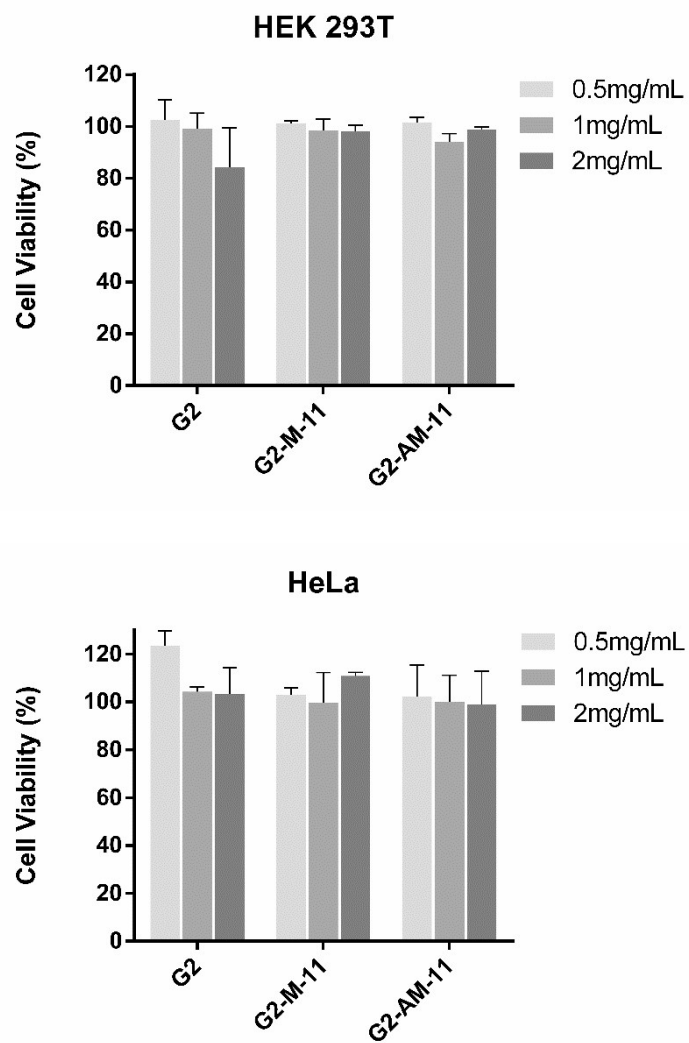


Fig. S13. MTT assay of polymer materials.