# Electronic Supplementary Information (ESI) *of*
Imidazolized magnetic nanovectors with endosome disrupting moieties for intracellular delivery and imaging of siRNA
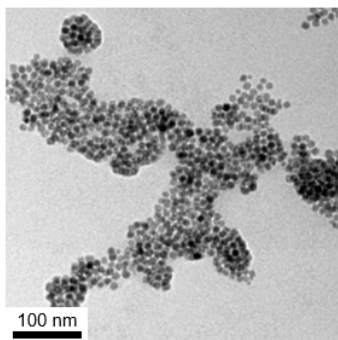
Eunjung Kim, Hwunjae Lee, Yonghee An, Eunji Jang, Eun-Kyung Lim, Byunghoon Kang, Jin-Suck Suh, Yong-Min Huh[*] and Seungjoo Haam[*]

[*]Department of Radiology, College of Medicine, Yonsei University, Seoul Republic of Korea
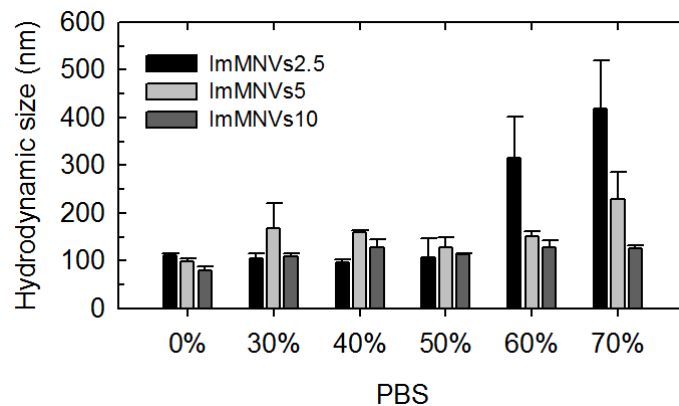[*]Department of Chemical and Biomolecular Engineering, Yonsei University, Seoul, Republic of Korea
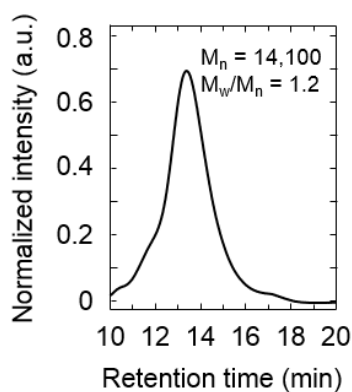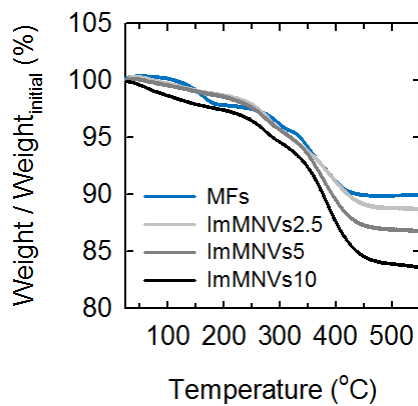
Fig. S1 A GPC trace of PLZ recorded at 40°C in DMF.

**Fig. S2** TEM image of non-imidazolized MNVs (MNVs).

Fig. S3 Hydrodynamic size of ImMNVs2.5, ImMNVs5, and ImMNVs10 prepared in different concentration of PBS by DLS.

Fig. S4 TGA curves of MFs and ImMNVs prepared with different PLI/MFs ratios (2.5, 5, and 10).

Table S1 Schematic illustration of the proposed closed-pack structure of ImMNVs and calculated numbers of PLI coated onto the surface of MFs in ImMNVs.
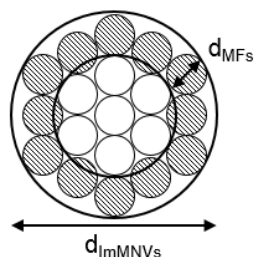
| Entry	[a]Diameter (nm)	[b]$N_{MFs, total}$	[c]N_{MFs}	[d]$N_{PLI, total}$	[e]N_{PLI}
ImMNVs2.5	61.7 ± 9.0	120	55	634	11.6
ImMNVs5	61.3 ± 8.6	118	54	743	13.7
ImMNVs10	49.2 ± 2.9	61	33	495	14.9

[a]The diameter of ImMNVs based on the TEM images (MFs: 11.3 ± 1.0 nm)

[b]The total number of MFs per ImMNV (all the spheres in the close-packed structure), which is given by the equation: $N_{MFs, total} = (d_{ImMNVs}/d_{MFs})^3 \times 0.74$, with d_{ImMNVs}, d_{MFs}, and 0.74 corresponding to the average diameter of ImMNVs and MFs determined from the TEM images, and the value of the highest packing density ($\approx \pi/3\sqrt{2}$) of ImMNVs[1].

[c]The number of MFs on the outer layer of ImMNV per particle (the outer patterned spheres in the close-packed structure), which is defined by the equation: $N_{MFs} = N_{MFs, total} - [(d_{ImMNVs}-d_{MFs} \times 2)^3 / d_{MFs}^3] \times 0.74$.

[d]The total number of PLI polymer encapsulated into each ImMNV, which is obtained using the equation: $N_{PLI, total} = [(N_{MFs, total} \times d_{MF}^3 \times \rho) \times R \times N_A] / M_n$, where ρ (g/cm^3) is the MF density, R is the organic/inorganic mass ratio determined by TGA analysis, N_A (mol^{-1}) is the Avogadro's number, and M_n (g/mol) is the molecular weight of PLI, respectively.

[e]The number of PLI polymer coated onto the MF surface in ImMNVs, calculated by dividing $N_{PLI, total}$ into N_{MFs}.
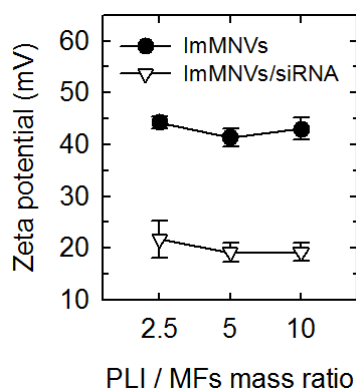
Fig. S5 Zeta potentials of ImMNVs prepared at various PLI/MFs mass ratios (2.5, 5, and 10) and ImMNVs/siRNA complexes (PLI/siRNA weight ratio = 25).
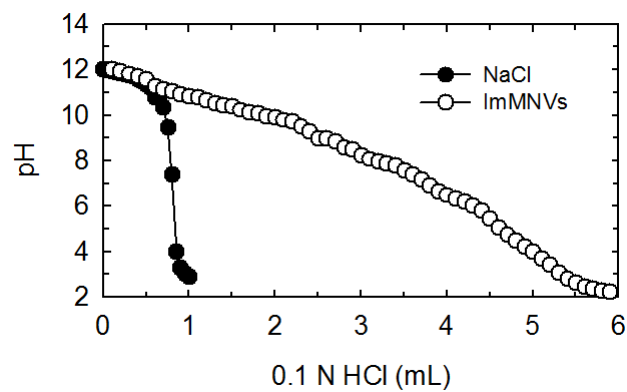
Fig. S6 Acid-base titration curves of 150 mM NaCl and ImMNVs10.

Reference
1. T. C. Hales, *Historical Overview of the Kepler Conjecture*, Springer New York, 2011.