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Electronic Supplementary Information (ESI)

A novel polymeric micelle used for in vivo MR imaging tracking of neural stem cells in acute ischemic stroke

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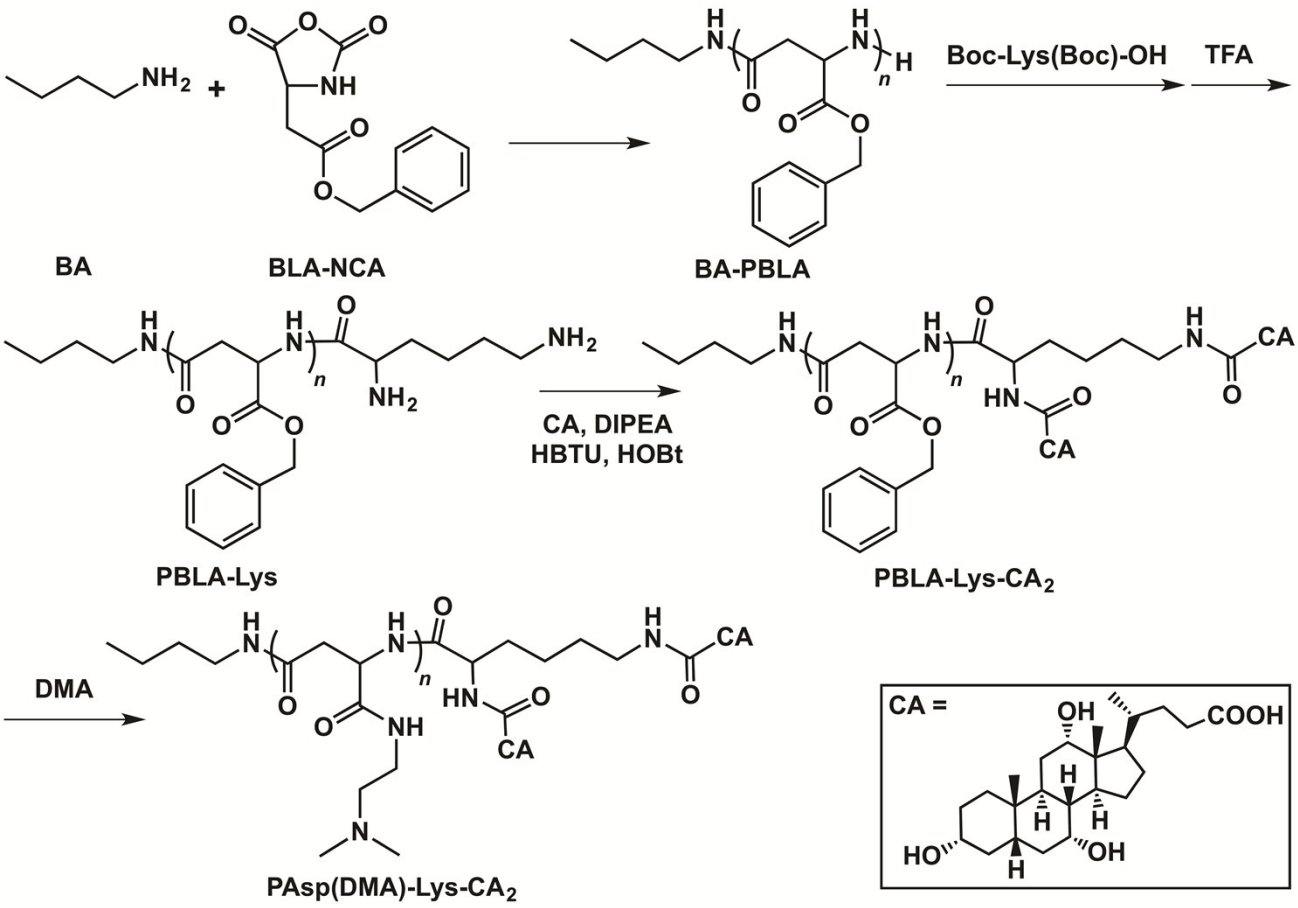
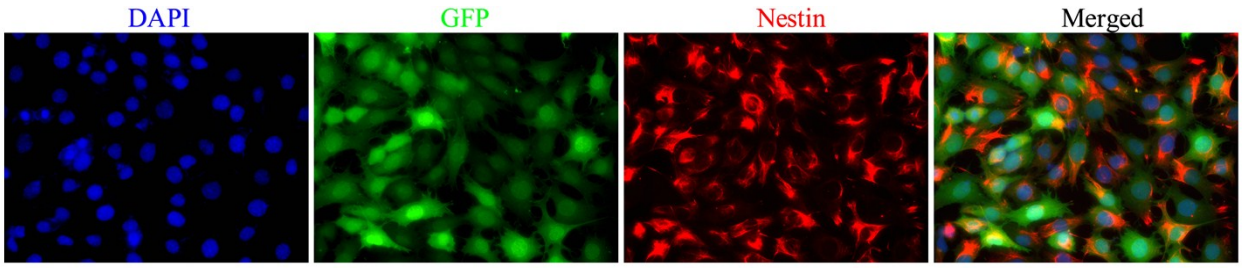
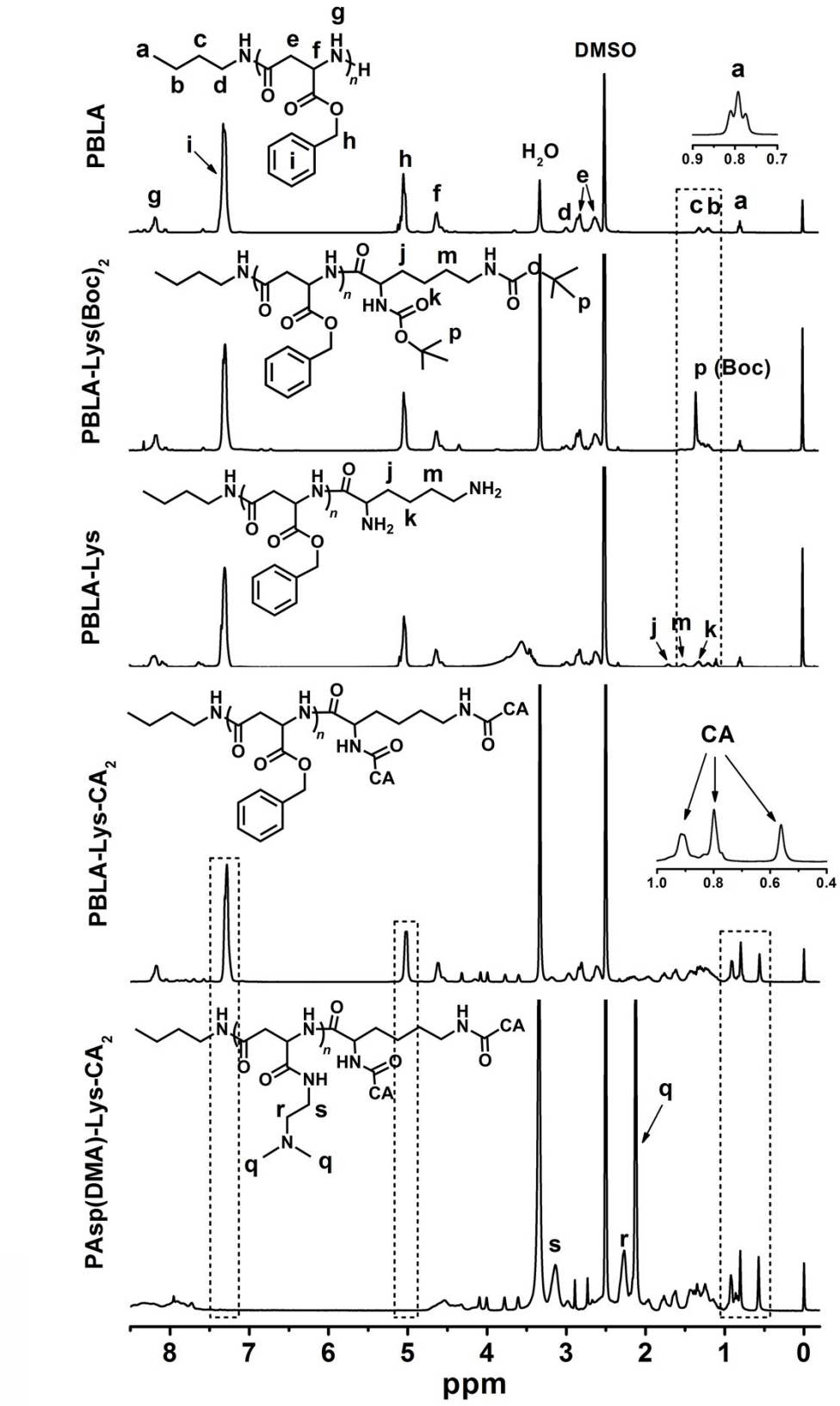


Supplementary Figure 1. Schematic diagram of synthesis of PAsp(DMA)-Lys-CA_2 copolymer.



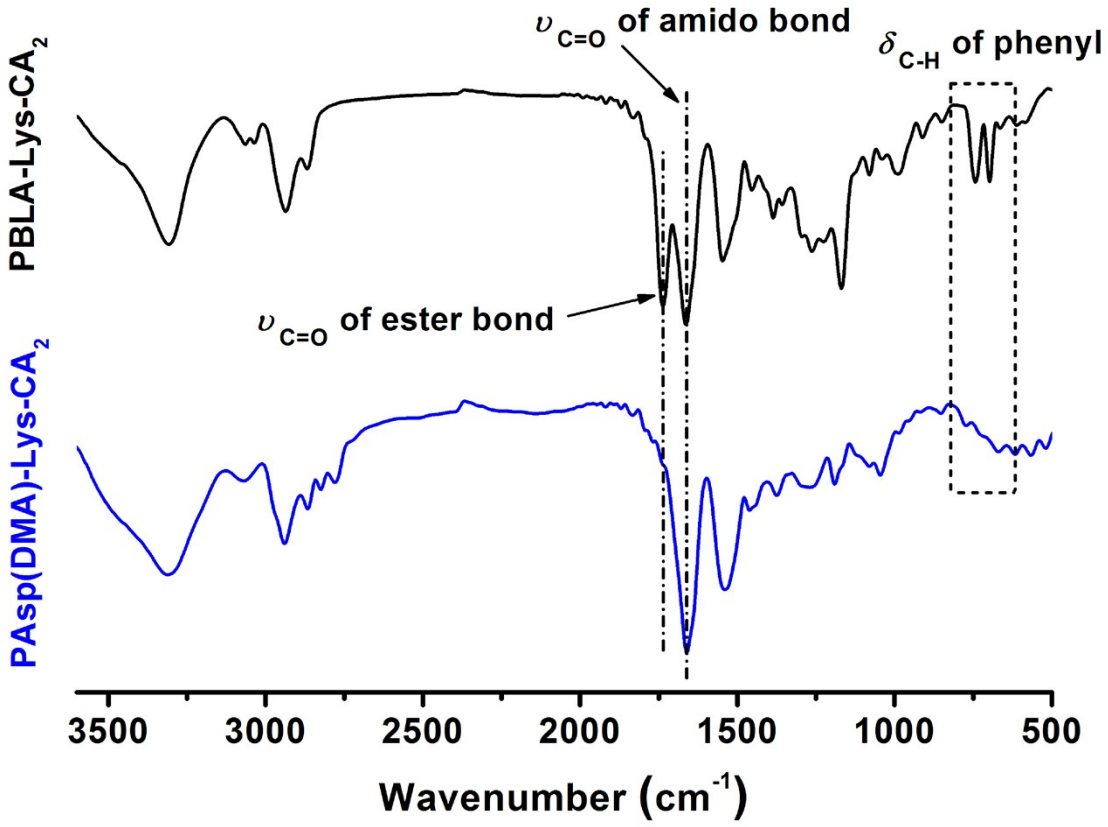
Supplementary Figure 2. The identification of C17.2 NSCs.

Immunoflurescence staining micrographs show that the cells are positive for GFP and nestin.

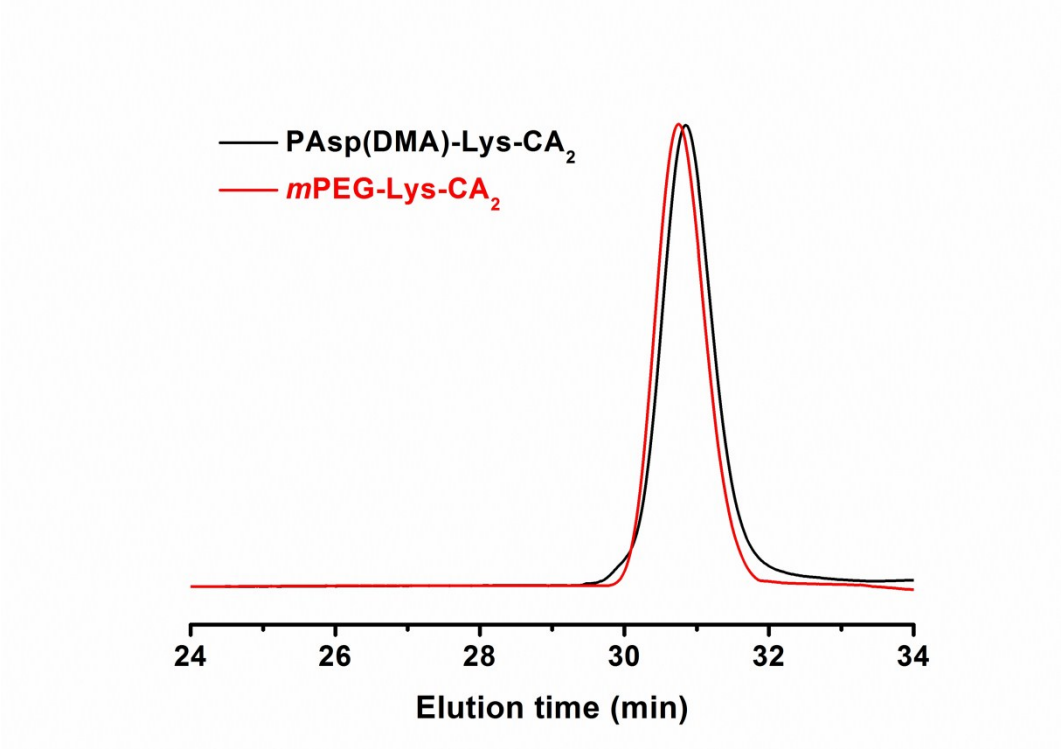


Supplementary Figure 3. ^{1}H NMR spectrum of PBLA, PBLA-Lys(Boc)$_2$, PBLA-Lys, PBLA-Lys-CA$_2$ and PAsp(DMA)-Lys-CA$_2$ in DMSO-d_6. The major resonance peaks of the copolymer in

the ^{1}H spectrum well fit into the expected chemical structure: 0.75-0.85 ppm (t, -$CH_2C\boldsymbol{H_3}$ of BA, a), 1.14-1.37 ppm (t, -$C\boldsymbol{H_2}C\boldsymbol{H_2}CH_3$ of BA, b and c), 2.98 ppm (m, -$C\boldsymbol{H_2}$CON-, d), 2.54-2.90 ppm (m, -$CHC\boldsymbol{H_2}$CON- of PBLA, e), 4.50-4.66 ppm (m, -$C\boldsymbol{H}CH_2$CON- of PBLA, f), 8.11-8.23 ppm (m, -$CHCH_2CON\boldsymbol{H}$- of PBLA, g), 4.96-5.14 ppm (m, -$C\boldsymbol{H_2}C_6H_5$ of PBLA, h), 7.22-7.42 ppm (m, -$CH_2C_6\boldsymbol{H_5}$ of PBLA, i), 1.27-1.70 ppm (m, -CH_2- of Lys, j, m and k), 2.29 ppm, 3.14 ppm (m, -CH_2- of DMA, r and s), 2.12 ppm (m, -CH_3- of DMA, q).



Supplementary Figure 4. FTIR spectra of PBLA-Lys-CA_2 and PAsp(DMA)-Lys-CA_2.

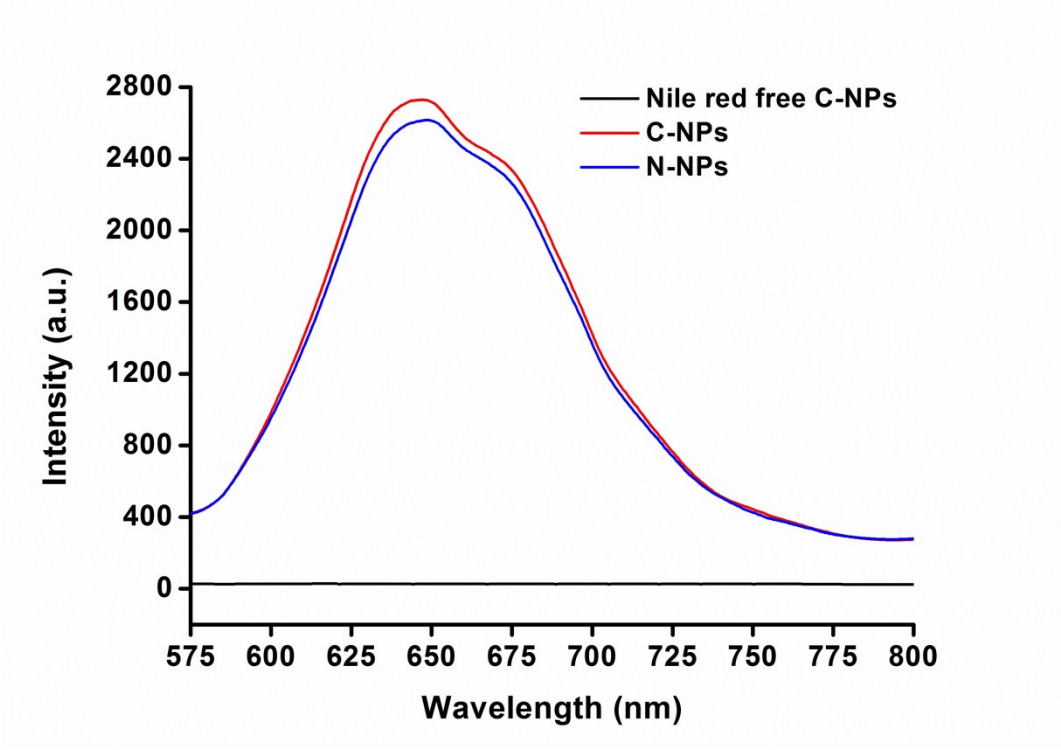


Supplementary Figure 5. GPC curves of PAsp(DMA)-Lys-CA_2 and *m*PEG-Lys-CA_2 in THF at a flow rate of 1 mL/min.

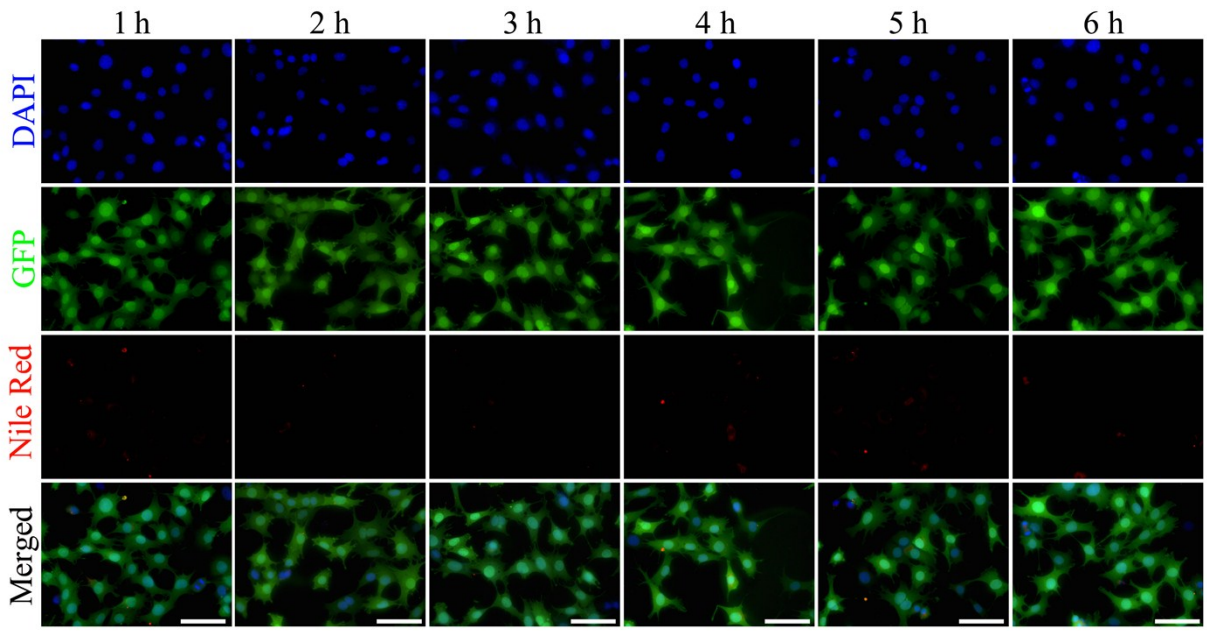
Supplementary Table 1. The molecular weight and polydispersity of polymers.

Polymer	M_n[a]	M_n[b]	M_w/M_n[b]
PAsp(DMA)-Lys-CA_2	2610	2780	1.16
*m*PEG-Lys-CA_2	2730	2900	1.09

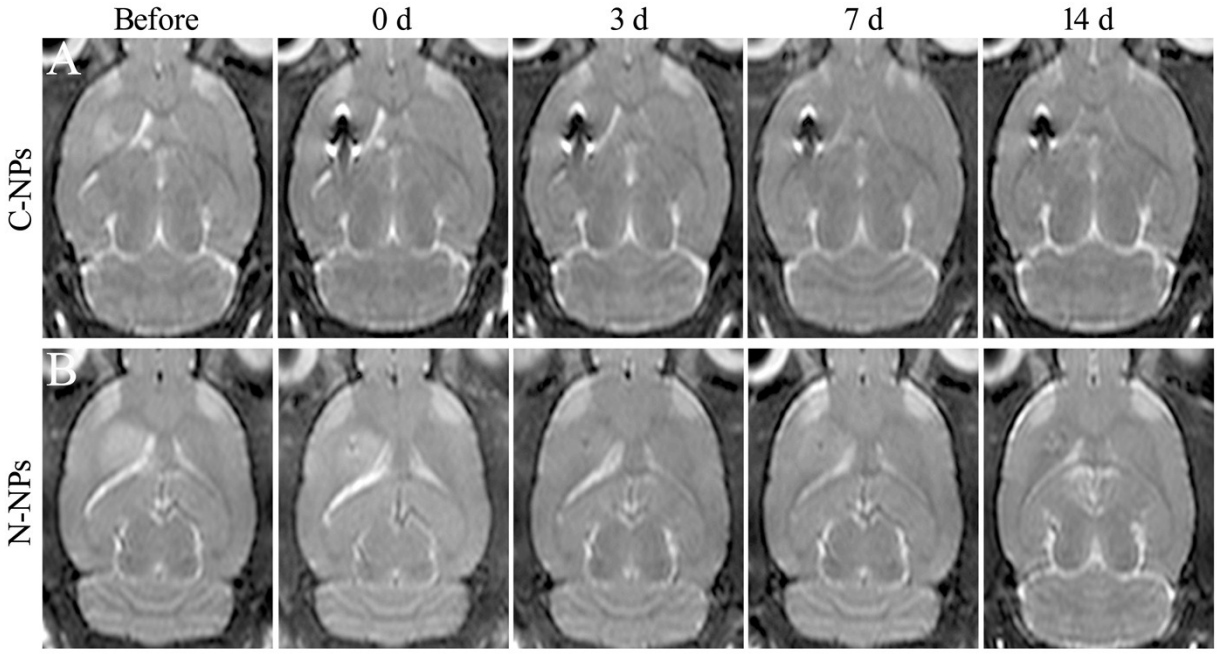
[a]calculated by ^{1}H NMR; [b]detected by GPC.



Supplementary Figure 6. Fluorescence spectroscopy of different nanoparticles. The emission fluorescence profiles show the presence of the nile red in SPIONs and nile red co-loaded cationic nanoparticles (C-NPs) and neutral nanoparticles (N-NPs) compared with nile red free, SPIONs loaded cationic nanoparticles (Nile red free C-NPs). Micelle concentration: 0.5 mg/mL; excitation wavelength: 550 nm; slit width: 10 nm; scanning speed: 500 nm/min.



Supplementary Figure 7. **The dynamics of cellular uptake of neutral polymeric micelles**. Fluorescence micrographs show few red particles (nile red) accumulated in the membrane and cytoplasm of GFP-C17.2 NSCs labeled with neutral PEG-Lys-CA2 (N-NPs) during the whole labeling process. Scale bar = 50 μm.



Supplementary Figure 8. In vivo MRI tracking of grafted, labeled NSCs. (A)T2-weighted MR images show the less pronounced hypointense signal of labeled GFP-C17.2 NSCs with cationic PAsp(DMA)-Lys-CA_2 (C-NPs) in the striatum ipsilateral to the infarcted hemisphere. (B) T2-weighted MR images only show a very thin, "black" needle track in the striatum of an animal treated with cells pre-labeled with neutral PEG-Lys-CA_2 (N-NPs).