Supplementary Materials for

Targeted Brain Delivery of Rabies Virus Glycoprotein 29-Modified Deferoxamine-Loaded Nanoparticles Reverses Functional Deficits in Parkinsonian Mice

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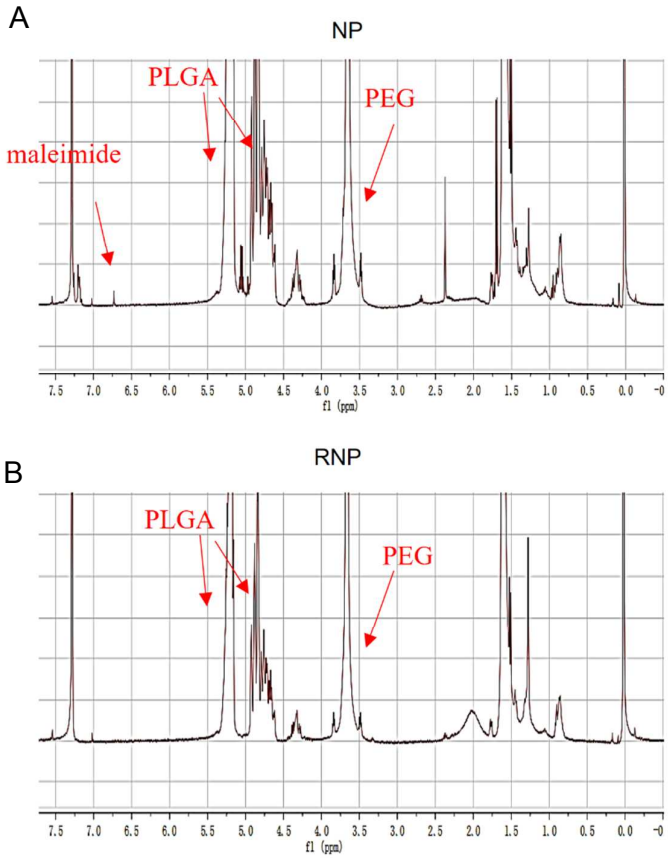

Figure S1. NMR spectra of nanoparticles before (**A**) and after (**B**) conjungation with RVG29-Cys dissolved in $CDCL_3$ at 400 MHz. The characteristic peaks of PLGA at 4.8 and 5.2 ppm, and that of PEG at 3.6 ppm appeared in both spectra. The peak of maleimide at 6.7 ppm was observed in non-conjugated nanoparticles, but disappeared after the nanoparticles were modified with RVG29-Cys, implying successful reaction between RVG29-Cys and the maleimide groups on nanoparticle surface.

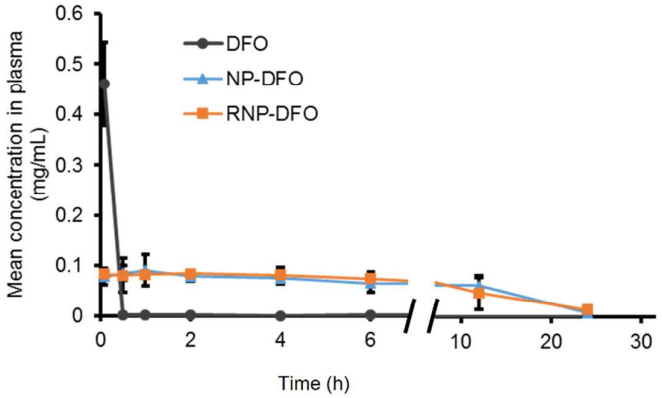

Figure S2. Plasma pharmacokinetic profiles of DFO after i.v. administration of free DFO (50 mg/kg) and NP-DFO and RNP-DFO (containing 50 mg/kg DFO) in rats. Plasmas samples were prepared from rat blood collected at various time intervals for measurements of free DFO concentration. Data expressed is mean ± S.D. of four rats.

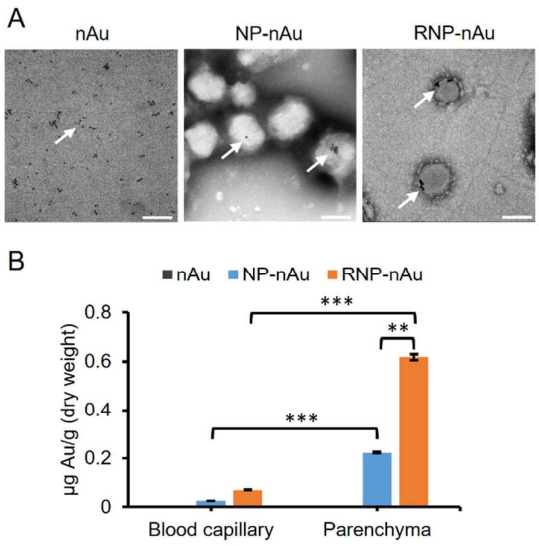

Figure S3. Intracerebral delivery efficiency of nAu-loaded nanoparticles. (A) Representative TEM images of gold nanoparticles (nAu) and the NP-nAu and RNP-nAu nanosystems used in this experiment. Small dark dots (indicated by white arrows) represent nAu. Scale bar: 200 nm. (B) Gold contents measured by ICP-MS in brain blood capillary and brain parenchyma derived from mice 4 h after nAu, NP-nAu or RNP-nAu treatment *via* tail vein. Gold was undetectable in the nAu-treated tissue samples. The equivalent dose of nAu was 30 mg/kg for each group. Data represent mean ± S.D. (n = 3). $^{**}p < 0.01$; $^{***}p < 0.001$.

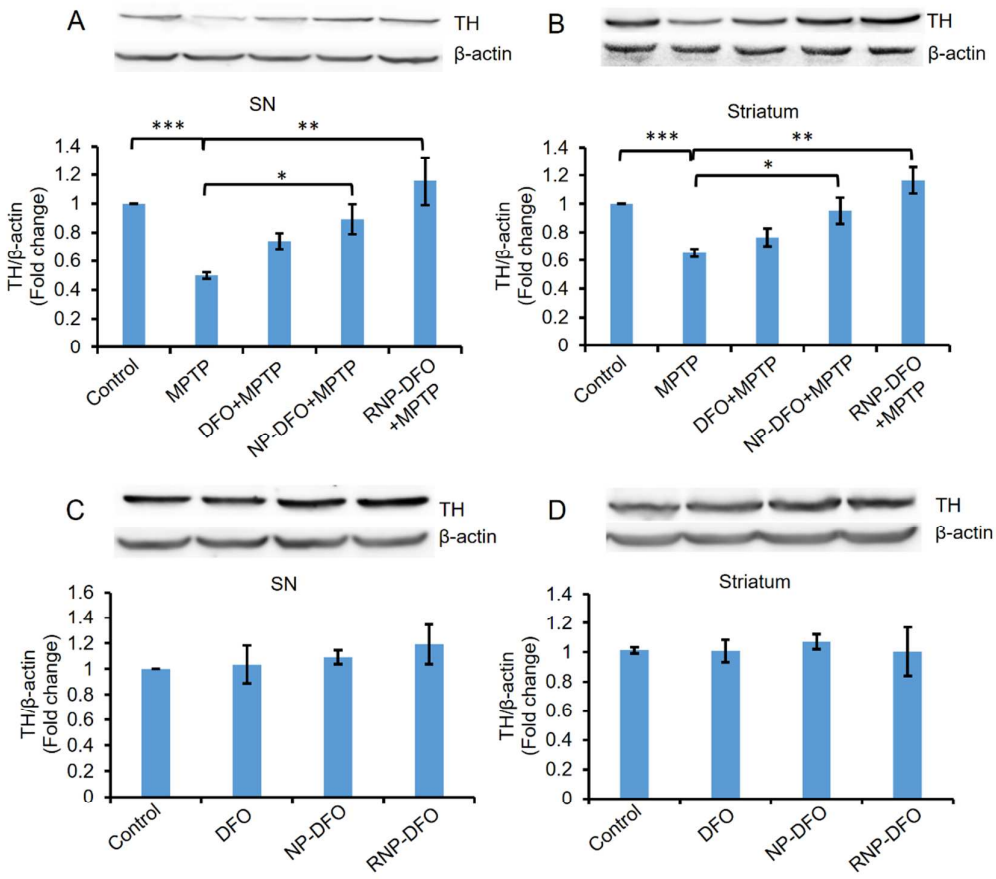

Figure S4. Western blot assays for tyrosine hydroxylase (TH) in the striatum or substantia nigra (SN) from PD (**A-B**) and normal (**C-D**) mice after treatment with different DFO formulations. β-actin was used as reference. Results were normalized using an ImageQuant software. Data are presented as mean ± S.D. (n = 6). *$p < 0.05$; **$p < 0.01$ and ***$p < 0.001$. The significant decrease in TH protein level caused by MPTP induction was reversed by RNP-DFO but not as effectively by NP-DFO or the free drug.

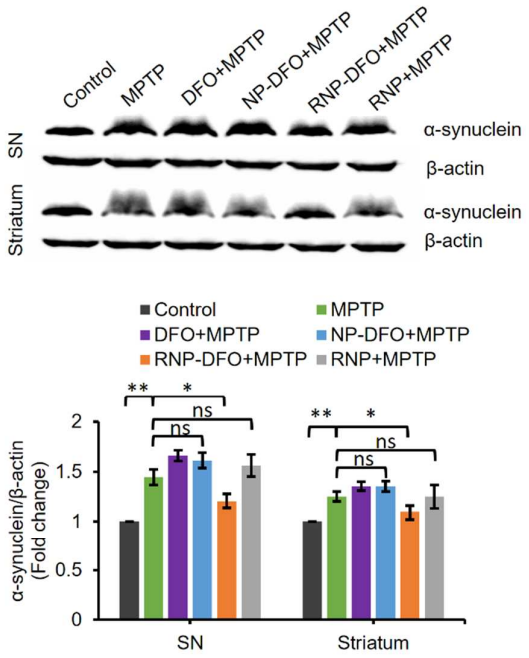

Figure S5. Western blot assays for α-synuclein in the striatum or substantia nigra (SN) from PD mice after treatment with different DFO formulations. β-actin was used as reference. Results were normalized using an ImageQuant software. Data are presented as mean ± S.D. (n = 6). *$p < 0.05$ and **$p < 0.01$. The significant increase in α-synuclein protein level caused by MPTP induction was reversed by RNP-DFO but not as effectively by NP-DFO, the free drug or RNP.

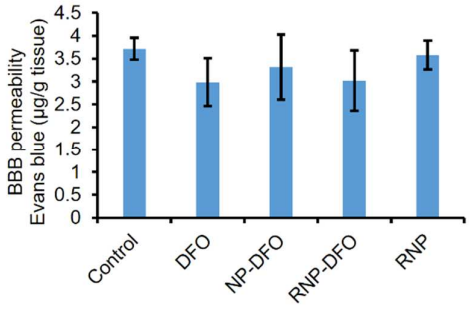

Figure S6. Effects of different DFO formulations treatment on the BBB permeability in normal mice. Mice were previously treated with treated with DFO, NP-DFO, RNP-DFO (equivalent DFO 35 mg/kg) or RNP once every other day for 12 days intravenously, and on the third day after the last treatment the permeability of their BBB was tested by Evans blue extravasation. Untreated mice was used as control. No significant difference was observed among the intracerebral Evans blue concentrations of the tested group. Data was represented as mean ± S.D. (n = 3).