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Supporting Information

A transport system based on a quantum dot-modified nanotracer is genetically and developmentally stable in pregnant mice

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EXPERIMENTAL METHOD

Immunofluorescence analysis (CD31)

Excised placenta was fixed with 4% paraformaldehyde (PFA) overnight and then dehydrated with 10% sucrose overnight. Dehydrated organs were embedded in optimal cutting temperature (OCT) compound (TISSUE-TEK 4583, Sakura Finetek Inc., Torrance, CA, USA) and sliced into sections (10 μm thick) using a cryotome (HM 525; Thermo Fisher Scientific). The sections were fixed in 4% PFA for 10 min and permeabilized with 0.1% Triton X-100. After incubation with 1% BSA for 1 h, anti-CD31 antibody (ab28364, Abcam) was added, and the samples were incubated overnight. After washing, Alexa Fluor 488-conjugated secondary antibodies were added and incubated for 1 h, followed by DAPI staining for 10 min. Sections were mounted in mounting solution (Dako Cytomation) and visualized by confocal fluorescence microscopy (LSM 880 META, Zeiss, Germany).

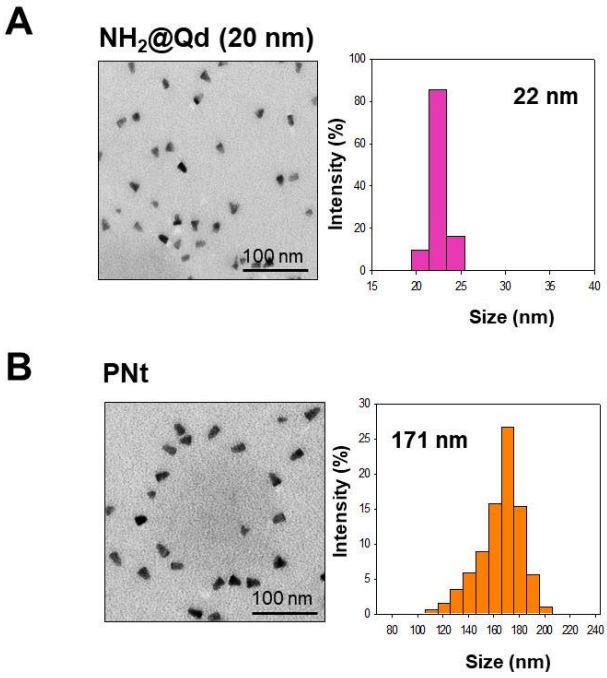

Fig. S1. Morphology and size of QDs and PNts

Morphology and size of QDs (**A**) and PNts (**B**) were visualized by TEM and DLS, respectively.

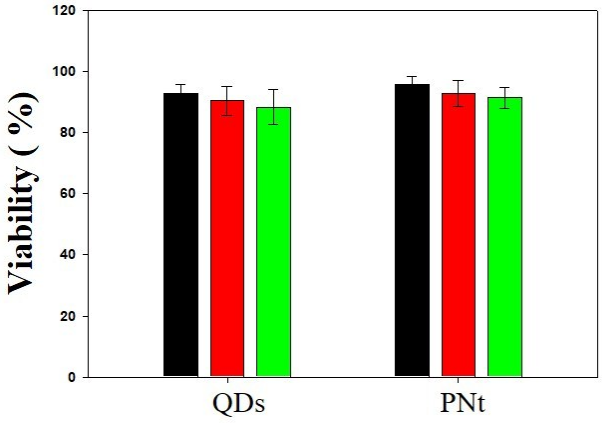

Figure S2. Viability of hMSCs exposed to QDs and PNts for 6 hours using the CCK-8 assay.

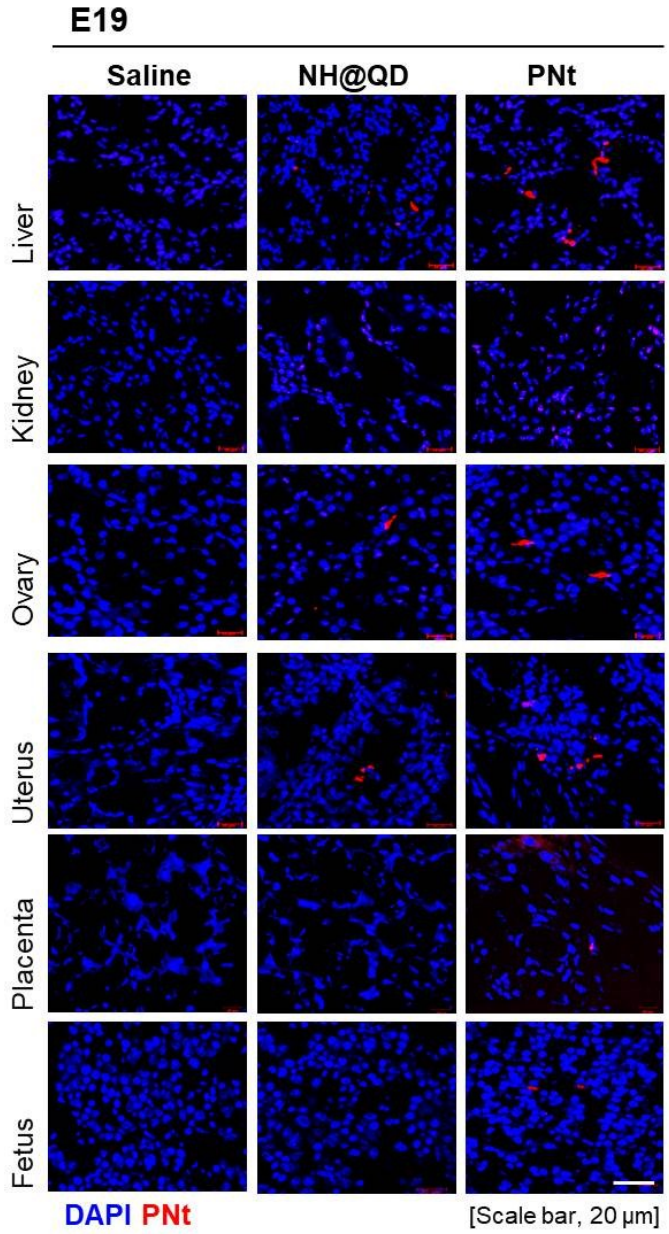

Fig. S3. Detection of PNts after tail vein injection into pregnant mice on an embryonic day (E)19

Dissected organs (liver, kidney, uterus, placenta, and fetus) from pregnant mice injected at E19 were visualized by confocal laser microscopy to detect PNts.

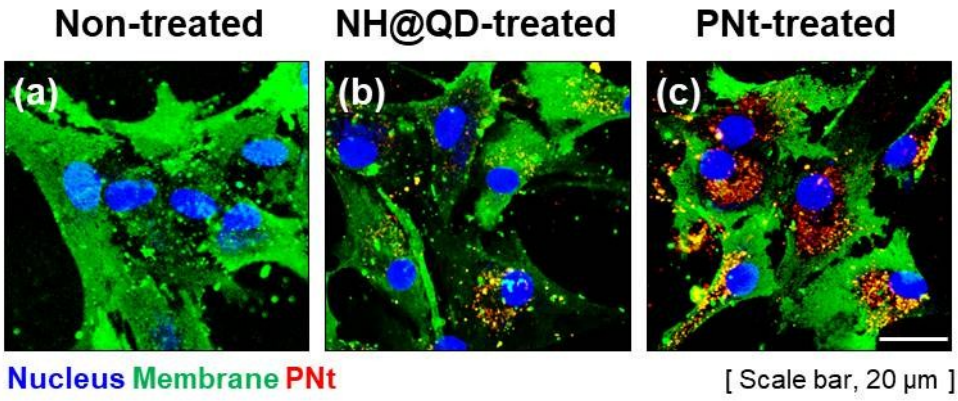

Fig. S4. Tracing PNts in human mesenchymal stem cells (hMSCs)

QDs or PNts were delivered efficiently into hMSCs 4 h after transfection, as visualized by confocal laser microscopy.

(a) Control, (b) QD655-treated hMSCs, (c) PNt-treated hMSCs.

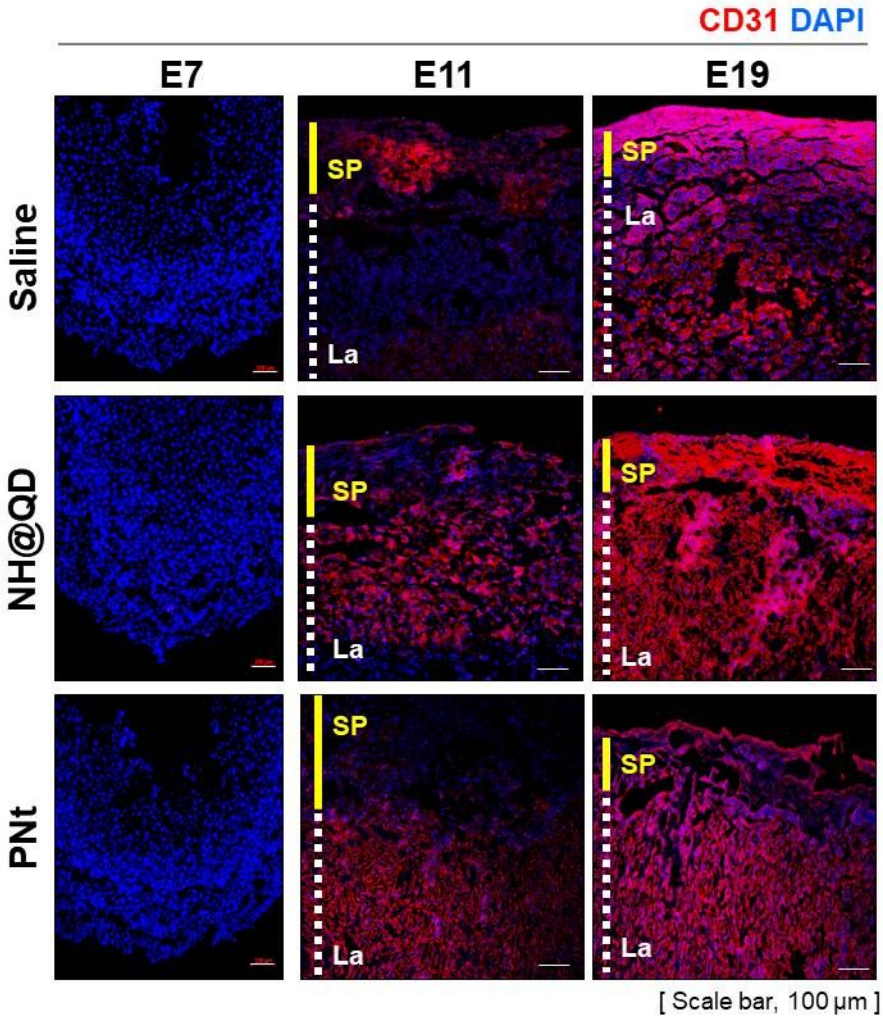

Fig. S5. Development of blood vessels in placentas dissected from pregnant mice injected with saline, NH@QDs, or PNts on E7, E11, and E19

One hour after injection of saline, QDs, or PNts into pregnant mice on E7, E11, and E19, placentas were dissected and evaluated for blood vessel development. In placentas from mice injected with saline and PNts, blood vessels had matured normally over the course of development.

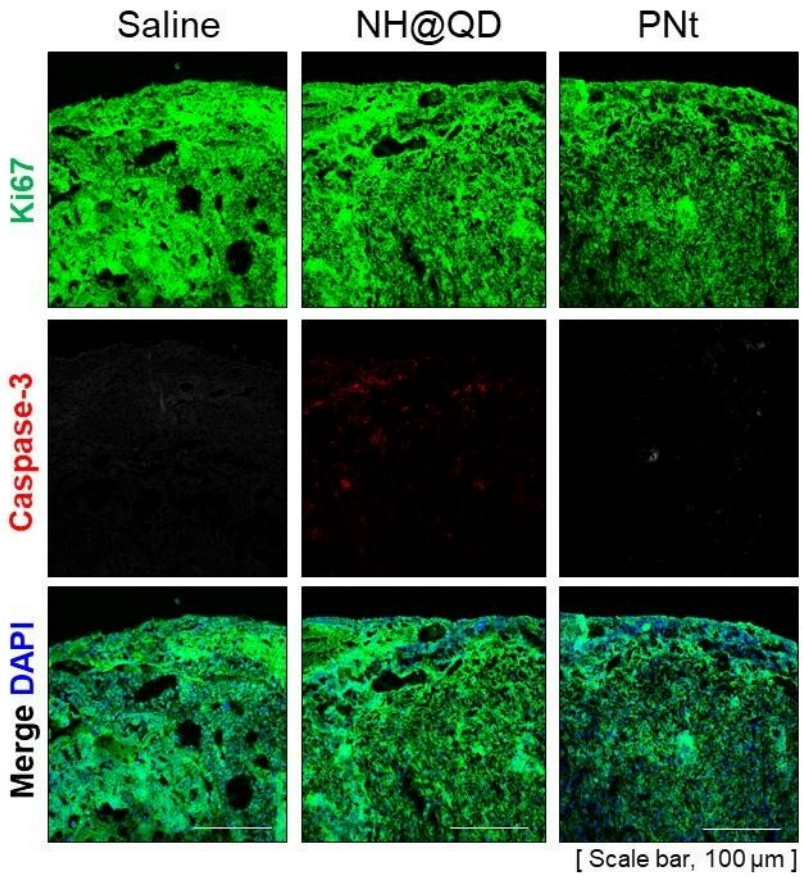

Fig. S6. Evaluation of damage and apoptosis in the placenta induced by PNt

One hour after injection of saline, QDs, or PNts into pregnant mice on E19, placenta was dissected to evaluate damage. Immunofluorescence to detect the proliferation marker Ki67 and the apoptotic marker caspase-3 revealed no dramatic apoptosis under any condition tested.

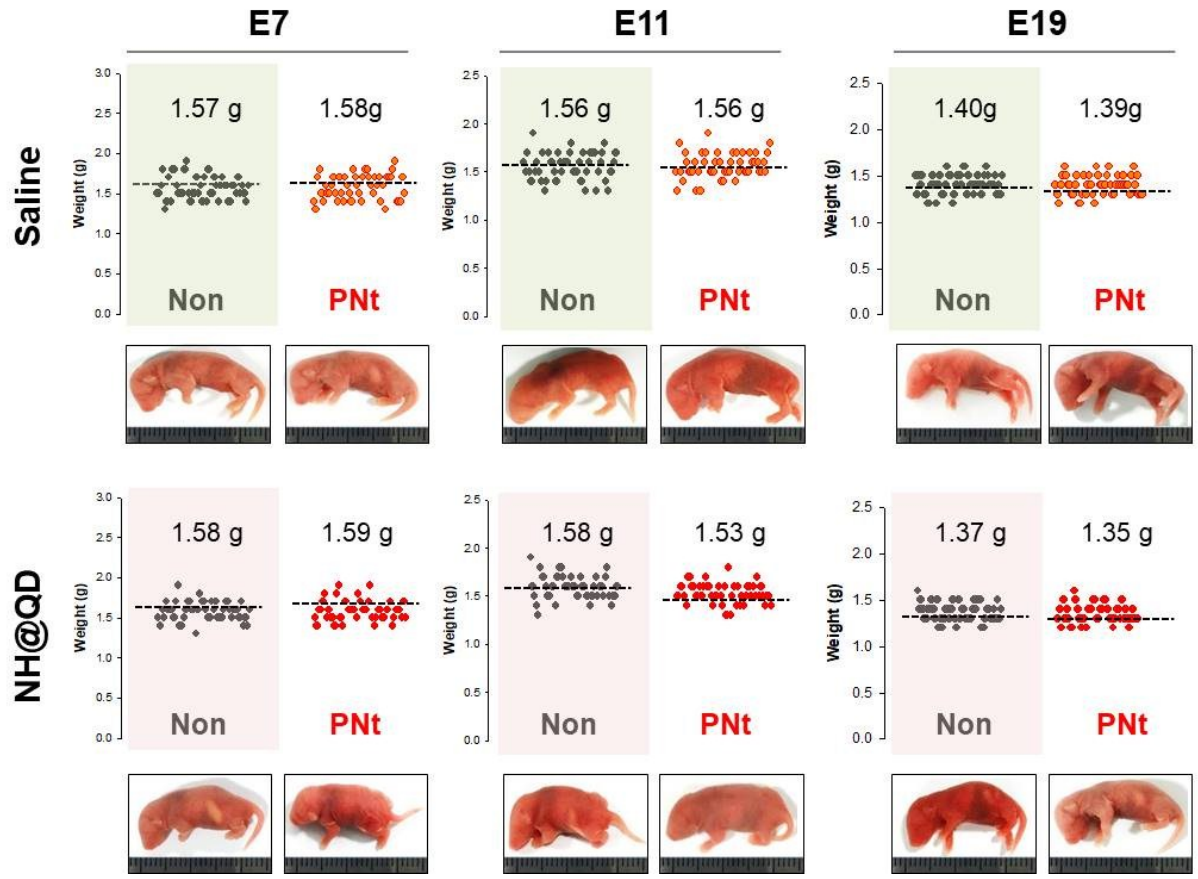

Fig. S7. Morphology, number, and weight of pups from pregnant mouse injected with saline or NH@QD at E7, E11, and E19