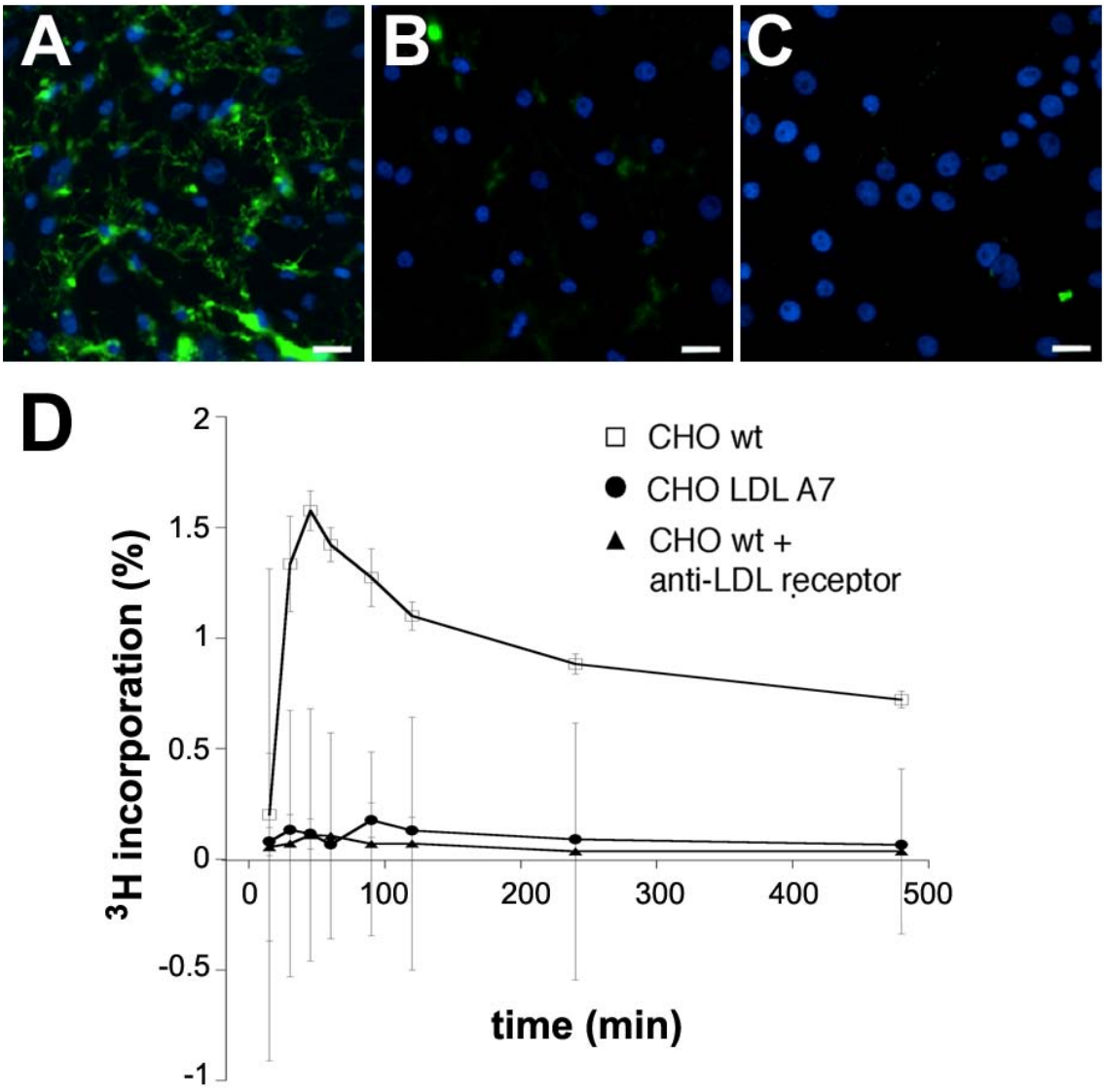
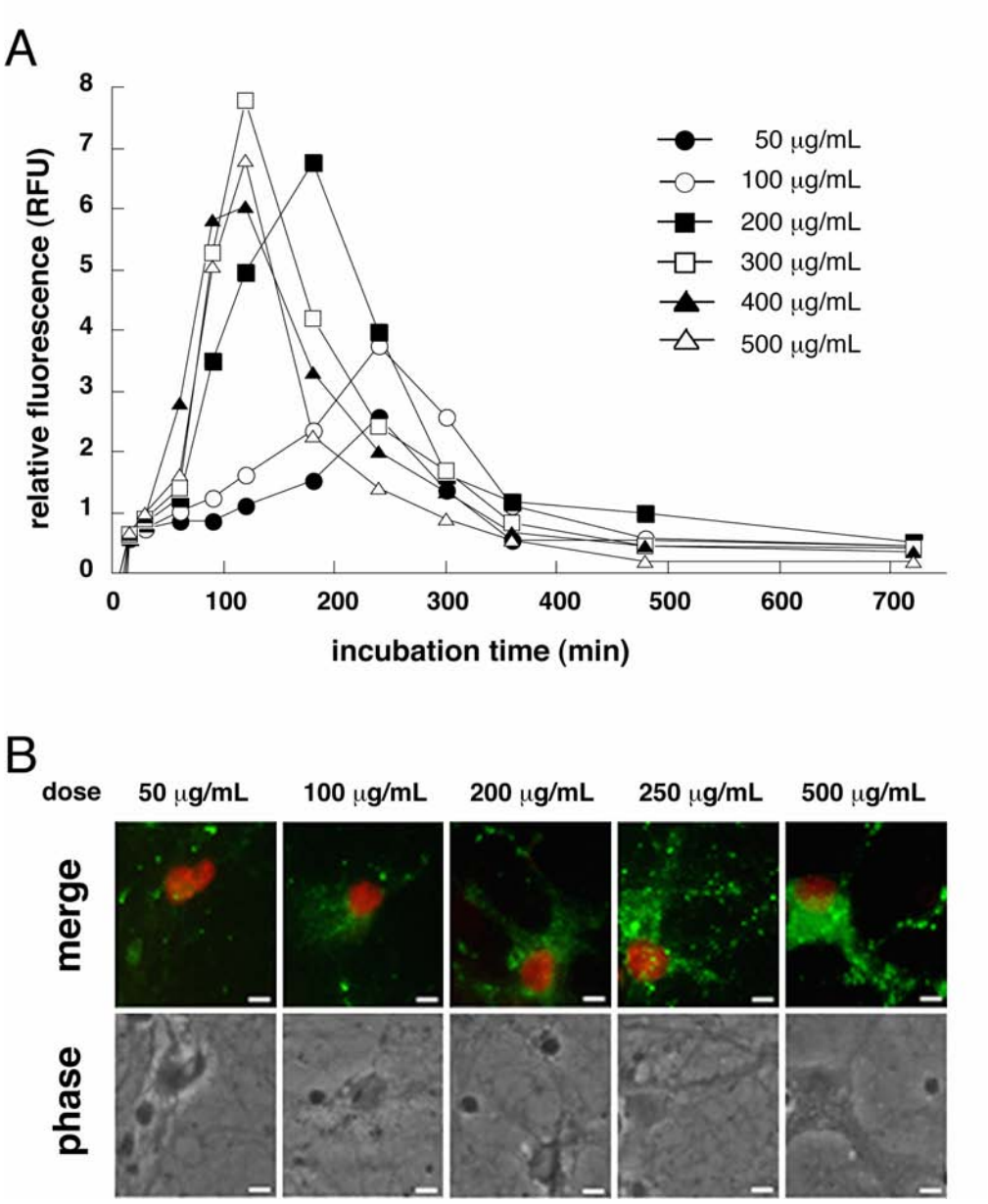
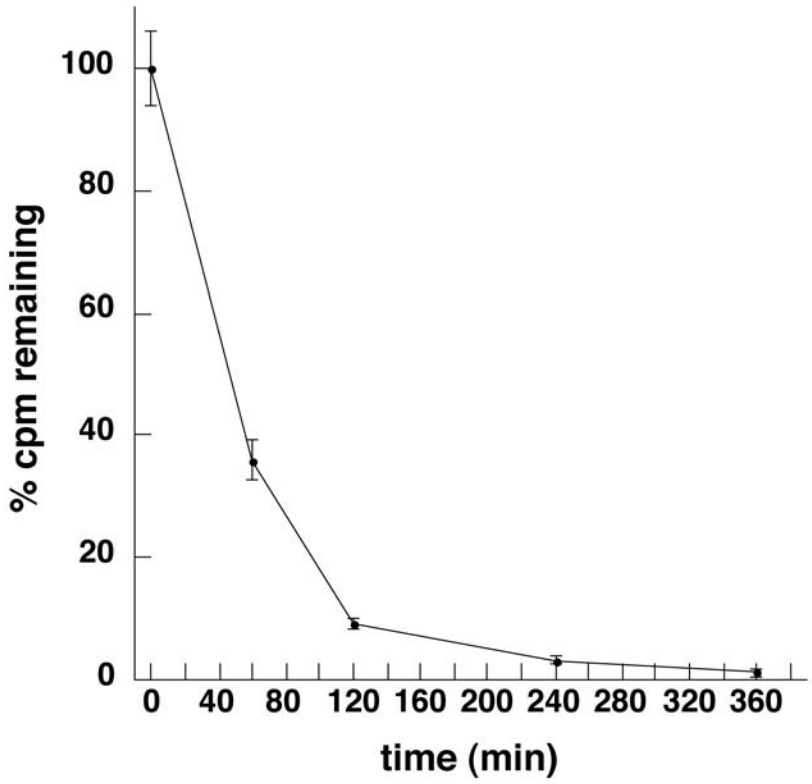


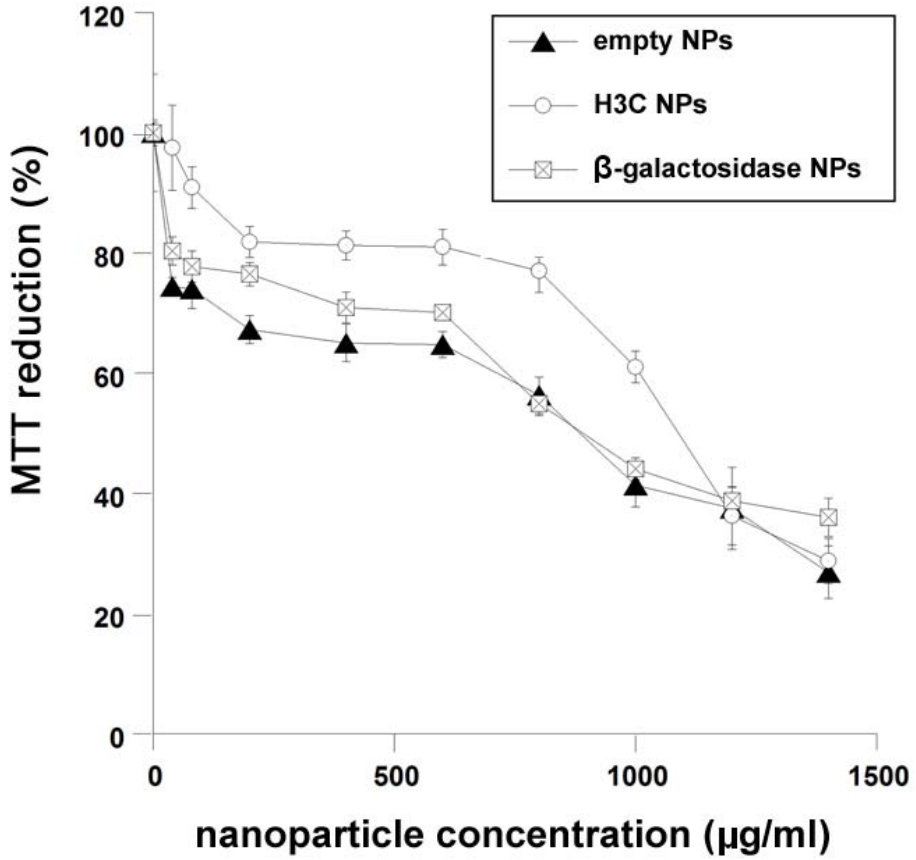
Supplementary Figure 1. Chinese hamster ovary (CHO) cells lacking functional LDL receptors do not take up FITC-NPs. CHO cells (generous gift of Dr. Andrew Belmont, University of Illinois, Urbana-Champaign) and CHO LDL-A7 cells (generous gift of Dr. Monty Krieger, Massachusetts Institute of Technology, Cambridge, MA) were maintained in Ham's F-12 medium (Sigma-Aldrich) supplemented with 10% fetal bovine serum, 50 units/ml penicillin, 50µM streptomycin, and 2mM glutamine at 37°C, 5% CO_2. Fluorescence microscopy images of (**A**) CHO cells, (**B**) CHO LDL-A7 cells, and (**C**) CHO cells pre-incubated for 2 hours with a neutralizing antibody against LDL receptor (100µg/mL). All cultures were treated with FITC-NPs (250µg/mL) for 2 hours and co-stained with DAPI. (**D**) Uptake and turnover of ^{3}H-nanoparticles by untreated CHO cells, untreated CHO LDL-A7 cells, and CHO cells with LDL receptor blocking antibody. The values plotted are mean ± S.D. Scale bar = 10µm.



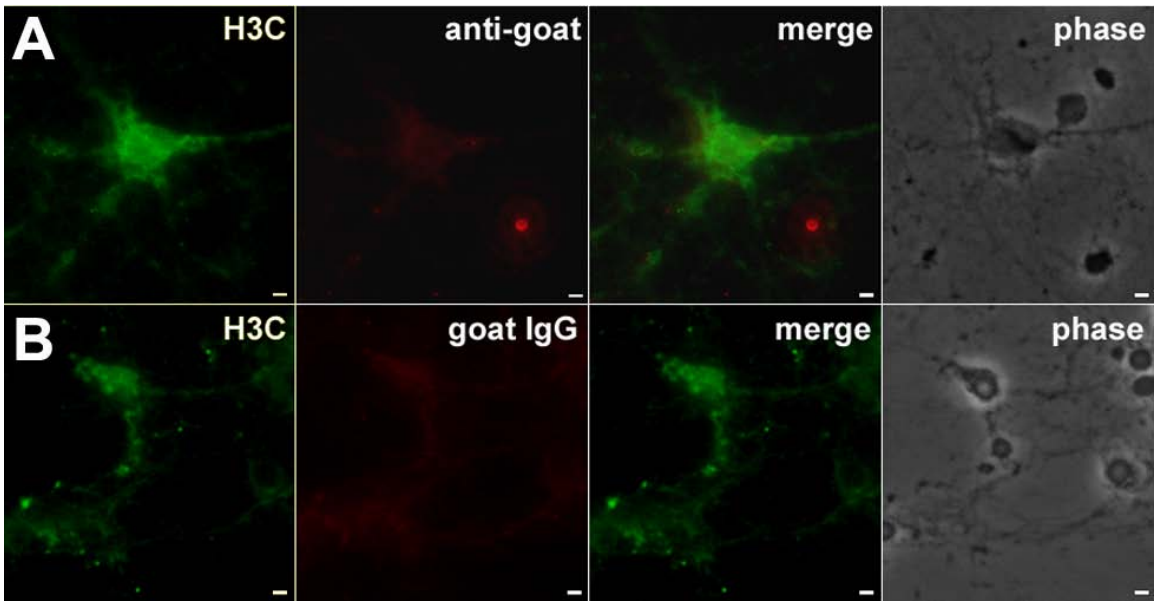
Supplementary Figure 2. Dose-dependence of FITC-NP uptake by primary hippocampal neurons. (A) Dose dependent FITC-incorporation was measured fluorometrically over time. Percent incorporation was determined by dividing the fluorescence intensity (excitation = 480nm, emission = 520nm) measured for each group of cells at each time point, normalized to the fluorescence intensity of the maximum dose (500μg/ml) in medium alone. **(B)** Fluorescence microscopy of neurons treated with varying dosages of FITC-labeled nanoparticles (green) and counterstained for the neuronal marker NeuN (red). Scale bar = 10μm.



Supplementary Figure 3. Rapid turnover of ^{3}H-labeled nanoparticles. Primary neurons were pulsed with 250µg/mL ^{3}H-NPs for two hours, then washed and incubated in non-particle containing medium at 37°C. Cells were washed and harvested at indicated time points and analyzed by scintillation counting to determine the amount of ^{3}H remaining. The values plotted are mean ± S.D. The half-life of the nanoparticles was determined ($t_{1/2}$ = 27 min) by exponential curve fit (R^2= 0.992, Kaleidagraph software).



Supplementary Figure 4. MTT assay of primary neurons treated with empty and protein-loaded NPs. Viability was assessed in neurons incubated with 0-1400µg/mL NPs for 24 hours. Neurons were grown in the inner 60 wells of 96-well plates and treated with nanoparticles at the specified concentrations for 24 hours, then incubated with 10µL of 5mg/mL 3-(4,5-dimethylthiazole-2-yl)-2,5-diphenyl tetrazolium bromide (Sigma) dissolved in medium for 2 additional hours at 37°C, 5% CO_2. The medium was then removed and 200µL 1M HCl in propanol (1:24 w/v) added to each well, and plates placed on a shaker for 10 minutes. Absorbance at 550-570nm was measured on a SpectraMax 340 microplate spectrophotometer (Molecular Devices, Sunnyvale, CA) and corrected for background. For each treatment group, the percent viability at each concentration represents the absorbance measured for neurons treated with the indicated dose of nanoparticles divided by the absorbance detected in untreated cells. The values plotted are mean ± S.D.



Supplementary Figure 5. Immunofluorescence controls for primary neurons treated with H3C-loaded NPs. (**A**) Cells were treated with nanoparticles loaded with the C-terminal anti-α-synuclein antibody H3C then stained with Alexa Fluor 488-conjugated anti-mouse and Cy3-conjugated anti-goat to demonstrate that colocalization does not occur non-specifically between antibodies. (**B**) Non-specific goat IgG + Cy3 anti-goat also did not colocalize with H3C. Scale bar = 10μm**.**