Supplementary Material (ESI) for Chemical Communications
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SUPPORTING INFORMATION

Experimental Methods: The Pep-1 peptide was incubated with CdSe@ZnS QDs (~15-20 nm in diameter) at molar ratio of 10:1 to 20:1 in phosphate buffer saline (PBS). The complexes were mixed and incubated at 37^{o}C for 15-30 min. The manufacturer's protocol was followed (Quantum Dot Corporation) for coupling the biotinylated peptides (NLS or GH3 peptides) to the QDs. Concentration of QDs used in this study range from 10 nmol to 40 nmol depending on the experimental set-up. Lower QD:Pep-1 concentrations were used in chamber slide experiments. The peptides were chemically synthesized by New England Peptide Inc. Cells were cultured in Dulbecco's modified Eagle's medium (DMEM) supplemented with 10% bovine serum albumin (BSA) at 37^{o}C in a humidified atmosphere with 5% CO_2. Cells were grown in 6-well plates to 75% confluence or in 4-well chamber slides. Cytotoxicity of QDs and QD:Pep-1 complexes was evaluated using the colorimetric MTS assay (Promega Corporation). Briefly, the QD:Pep-1 complexes were formed in phosphate buffered saline (PBS) for 30 min and were added to mammalian cells in a 96-well assay plate and incubated 1hr at 37^{o}C in serum-free DMEM. Fresh DMEM with 10% BSA was added and cells were incubated an additional 16-24 hrs. The MTS reagent solution was pipetted into each well (20 μl for every 100 μl culture medium) and the cells were incubated for 1 hr at 37^{o}C. The absorbance of soluble formazan was measured at 490 nm using a plate reader. All samples were prepared in triplicates. For mitochondrial staining, the MitoTracker® Green FM (Molecular Probes Inc.) is green-fluorescent mitochondrial stain that localizes to mitochondria regardless of mitochondrial membrane potential. For the GH3-QD experiments, the cells were monitored for the progression of apoptosis, which is evident after 16-18 hr. The experiments with GH3-QDs were done in duplicates and repeated at least twice. The cellular uptake of QDs with or without Pep1 was monitored using fluorescence microscopy and flow cytometry. The cells were incubated with QD:Pep1 complexes for 6 hr and then washed several times in PBS prior to trypsinization. The cells were immediately analyzed using flow cytometry.

Table S1. Peptides used in this study

Pep1:	H2N-Lys-Glu-Thr-Trp-Trp-Glu-Thr-Trp-Trp-Thr-Glu-Trp-Ser-Gln-Pro-Lys-Lys-Lys-Arg-Lys-Val-COOH
NLS:	Biotin-Lys-Gly-Gly-Gly-Pro-Lys-Lys-Lys-Arg-Lys-Val-COOH
GH3:	Biotin-Lys-Ser-Glu-Phe-Gly-Cys-Trp-Asp-Leu-Leu-Ala-Gln-Ile-Phe-Cys-Tyr-Ala-Leu-Arg-Ile-Tyr-COOH

Figure S1. MTS assay for cytotoxicity of QDs, Pep1 and Pep1-QDs in HeLa cells. We observed no cytotoxic effect of the QDs, Pep1 or Pep1-QDs, at the concentrations that were used in our studies.

Figure S2. Confocal microscopy image of HeLa cells that have internalized QDs:Pep-1. Confocal fluorescent slices of cells with QDs:Pep1. The cells were incubated with QDs:Pep1. The cells were then fixed, stained with a control FITC-labeled antibody that stains the cytosol

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and analyzed by confocal microscopy. The dark void is the nucleus (N) The fluorescent images on the left are a stack of 32 images (z-series) taken 1 μm apart. The images on the right are images that were equalized using the imaging software showing the cytosolic distribution of the QDs (red) FITC-labeled antibodies (green), and regions of co-localization (orange).

Figure S3. Localization of QDs:Pep1 in HeLa cells after 6 hr incubation. (A) Light micrograph. (B) Fluorescence micrograph showing the internalization of QDs. The nucleus was stained using DAPI.

Figure S4. Fluorescence/phase micrograph of HeLa cells showing the uptake of QDs (carboxyl-terminated) lacking the streptavidin coating using the peptide carrier Pep1.

Figure S5. Comparison of the uptake of QDs into HeLa cells with or without the peptide carrier Pep1.

Figure S6. Nuclear localization NLS-QDs in HeLa cells. The images in Figure 1C &D were merged in image C.

Figure S7. Mitochondrial localization of the GH3-QDs in HeLa cells after 16 hr of incubation. Co-localization of the MitoTracker® Green FM and the GH3-QDs.

Figure S8. Localization of GH3-QDs in HeLa cells after 8 hr incubation.

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Figure S1

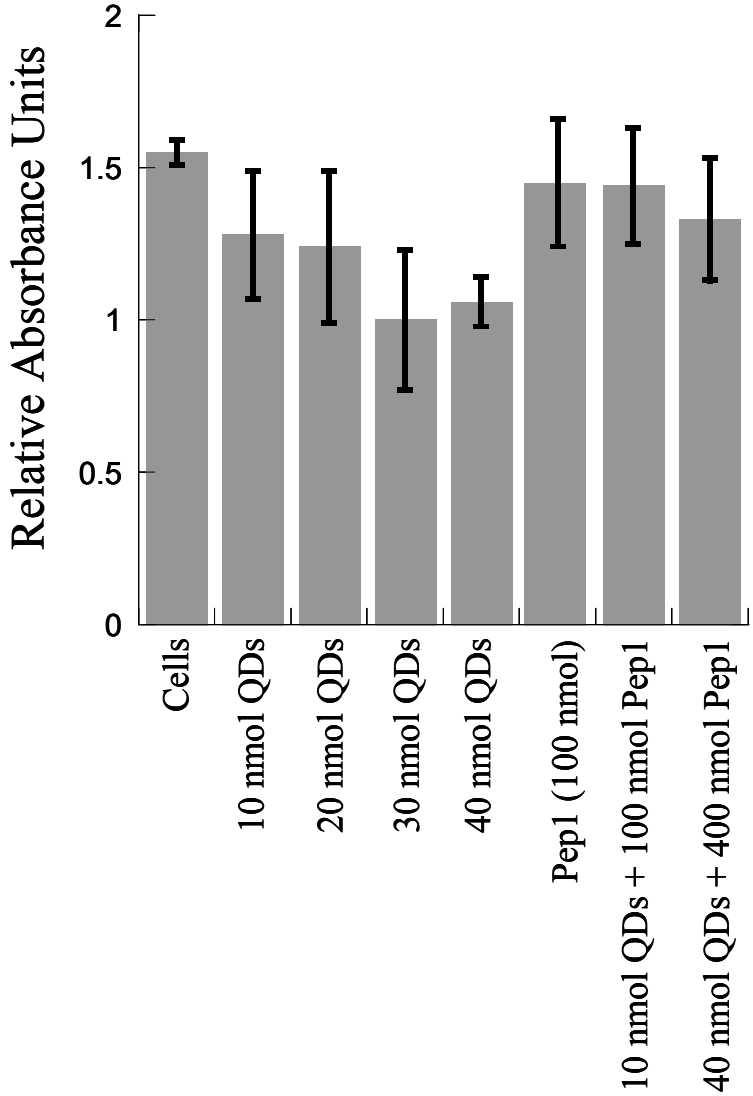

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Figure S2

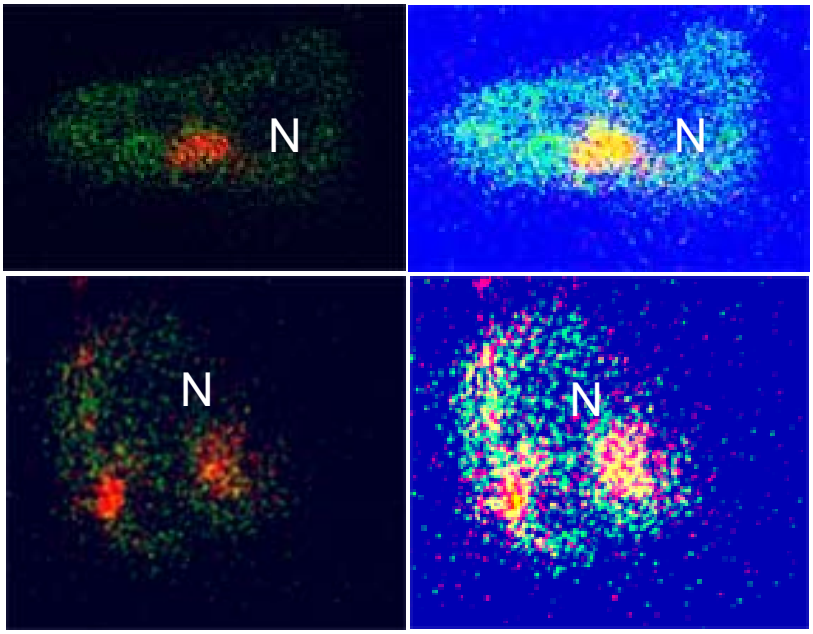

Figure S3

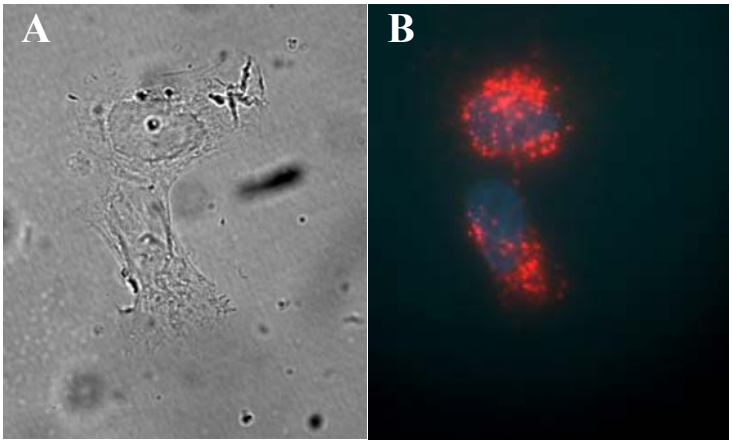

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Figure S4

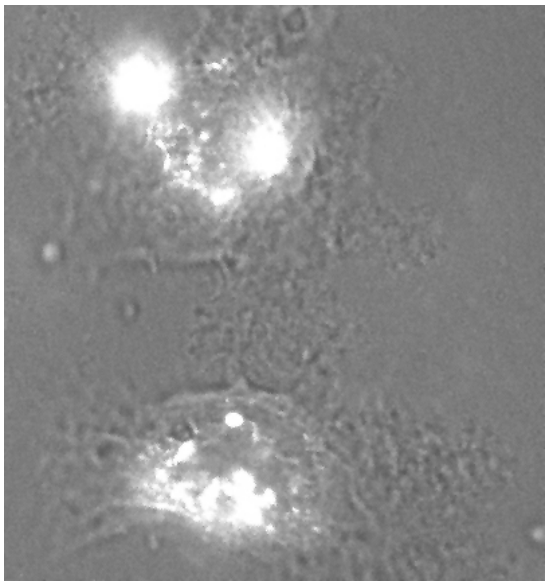

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Figure S5

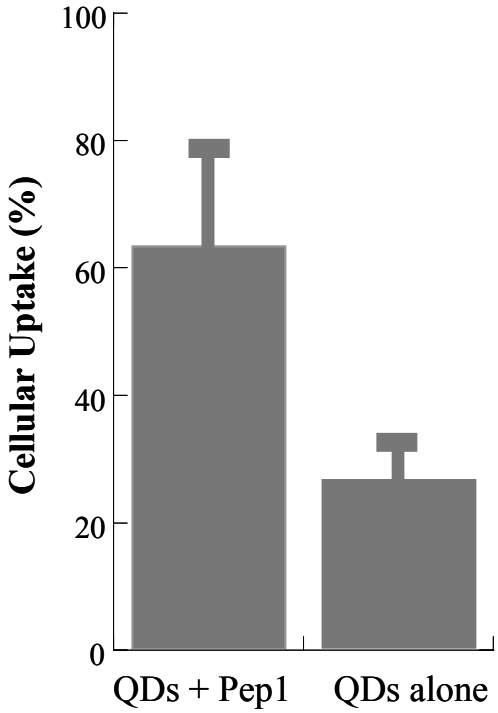

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Figure S6

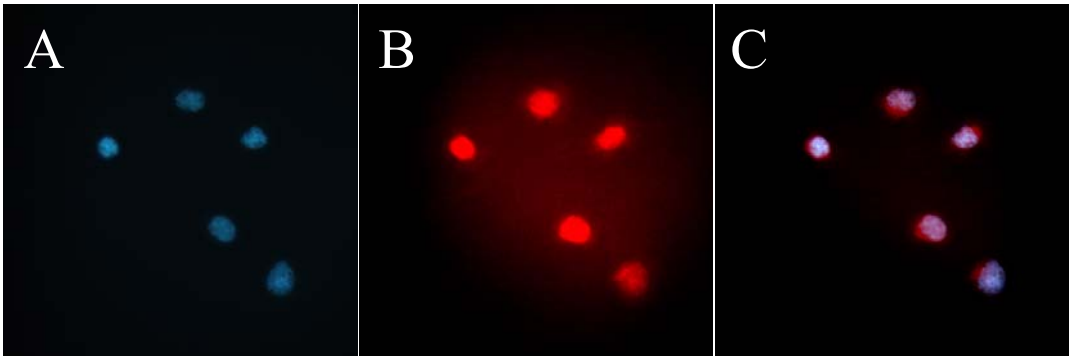

Figure S7

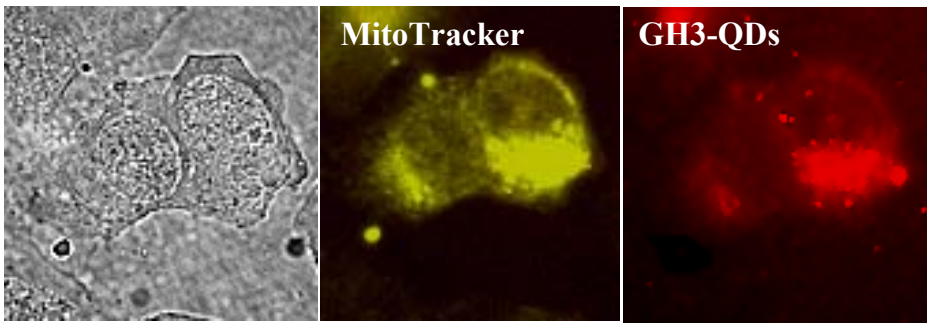

Figure S8