Zwitterionic Chitosan-Polyamidoamine Dendrimer Complex Nanoparticles as a pH-Sensitive Drug Carrier

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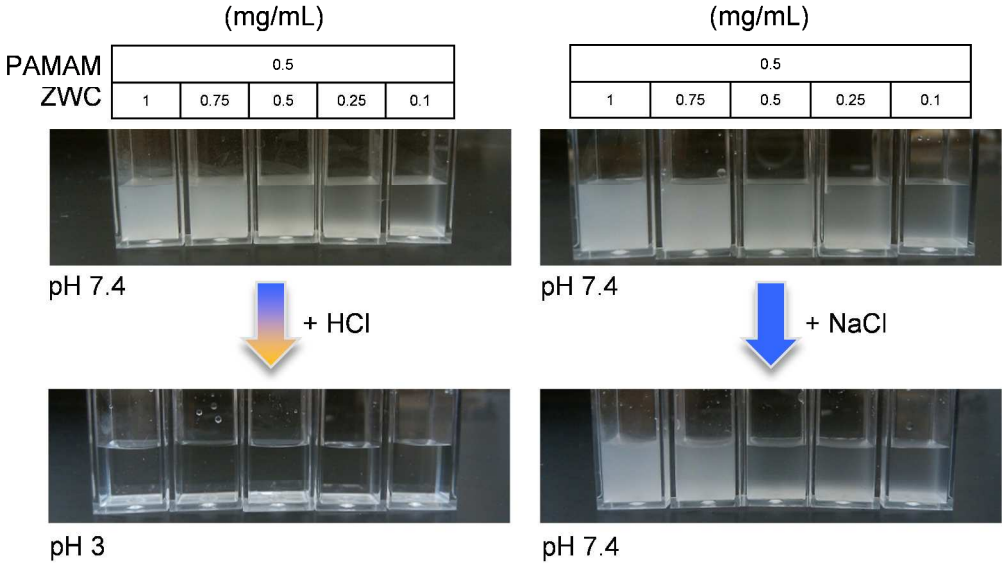
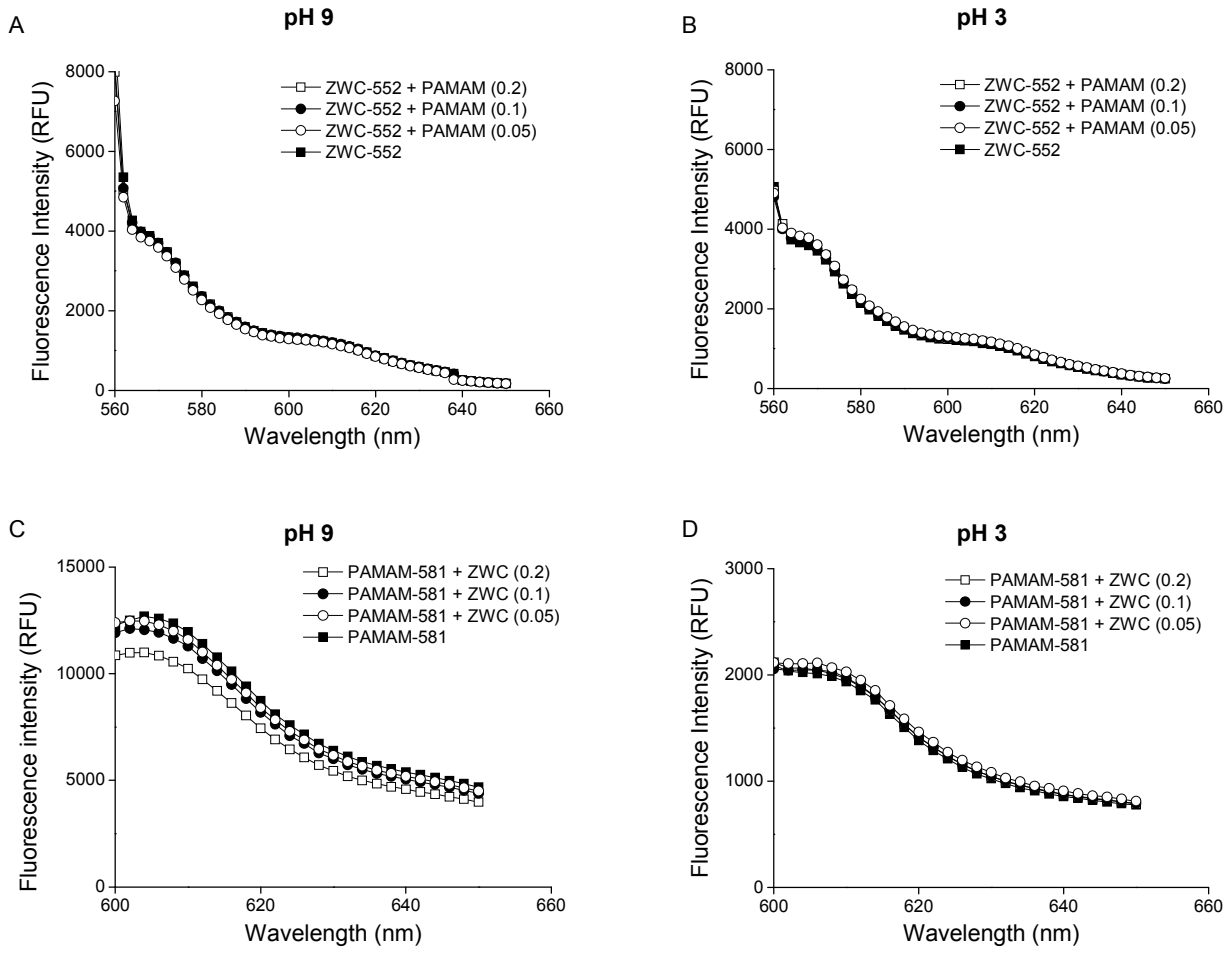
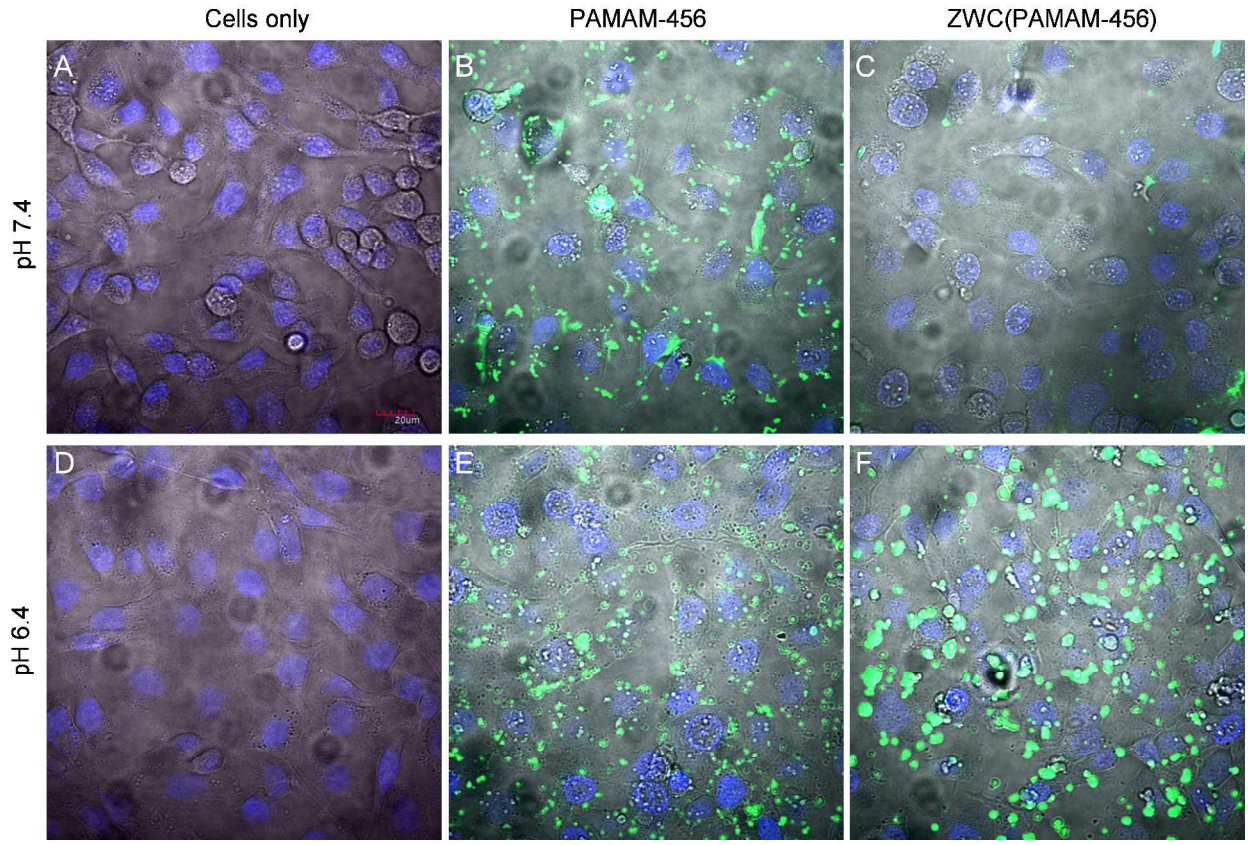
Supporting Figures



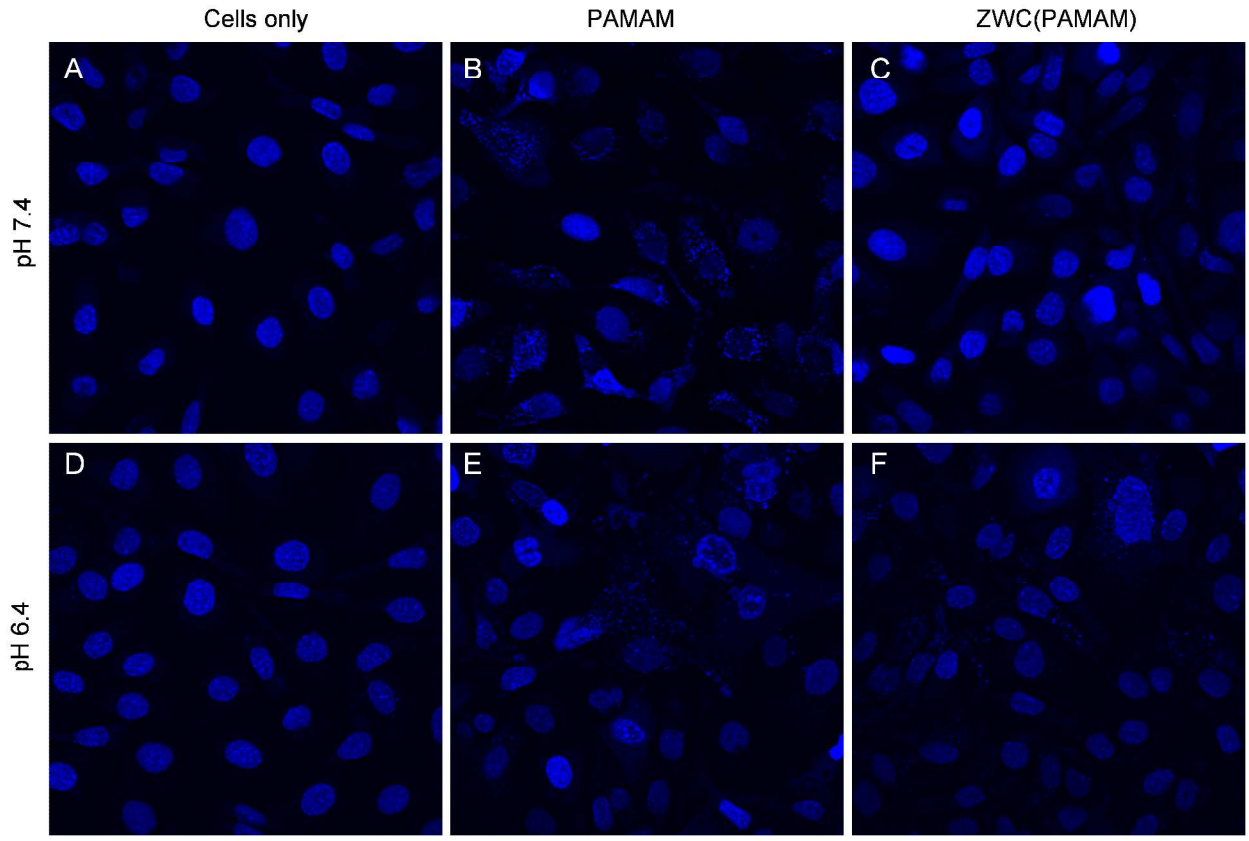
Supporting Fig. 1. pH dependent dissociation of ZWC(PAMAM) upon pH decrease from pH 7.4 to 3 by the addition of hydrochloric acid (left). The addition of NaCl that provided the same degree of ion increase and dilution effect without changing the pH did not induce significant decrease in turbidity (right).



Supporting Fig. 2. Fluorescence profiles of (A) ZWC-552 (0.2 mg/mL) in the presence of unlabeled PAMAM (0.05-0.2 mg/mL) at **pH 9** (excited at 544 nm; emission scanned from 560 to 650 nm), (B) ZWC-552 (0.2 mg/mL) in the presence of unlabeled PAMAM (0.05-0.2 mg/mL) at **pH 3** (excited at 544 nm; emission scanned from 560 to 650 nm), (C) PAMAM-581 (0.2 mg/mL) in the presence of unlabeled ZWC (0.05-0.2 mg/mL) at **pH 9** (excited at 578 nm; emission scanned from 600 to 650 nm), and (D) PAMAM-581 (0.2 mg/mL) in the presence of unlabeled ZWC (0.05-0.2 mg/mL) at **pH 3** (excited at 578 nm; emission scanned from 600 to 650 nm). Each plot is representative of three replicates.



Supporting Fig. 3. Cellular uptake of PAMAM-456 or ZWC(PAMAM-456) at pH 7.4 (top) and pH 6.4 (bottom): (A, D) cells only, (B, E) PAMAM-456 (0.5 mg/mL), and (C, F) ZWC(PAMAM-456) equivalent to PAMAM-456 (0.5 mg/mL) and ZWC (1 mg/mL). Fluorescence images (green: PAMAM-456; blue: nuclei) were overlaid with transmission images.



Supporting Fig. 4. Nuclei of cells treated with PAMAM or ZWC(PAMAM) at pH 7.4 (top) and pH 6.4 (bottom): (A, D) cells only, (B, E) PAMAM (0.5 mg/mL), and (C, F) ZWC(PAMAM) equivalent to PAMAM (0.5 mg/mL) and ZWC (1 mg/mL).

SKOV-3 ovarian carcinoma cells (ATCC, Rockville, MD) were cultured in RPMI-1640 medium supplemented with 10% fetal bovine serum (FBS), 100 U/mL penicillin, and 100 μg/mL streptomycin. The cells were plated in 35 mm diameter glass bottom dishes at a density of 800,000 per dish. After overnight incubation, the medium was replaced with a suspension of PAMAM dendrimer or ZWC(PAMAM) complex. Here, the PAMAM sample was prepared in PBS, and the ZWC(PAMAM) complex was prepared in PBS by mixing ZWC with PAMAM dendrimer at a 2:1 ratio. The suspensions were supplemented with 10% FBS, and their pH was adjusted to 7.4 or 6.4 before adding to the cells. The final concentration of each component in the suspensions was 1 mg/mL ZWC and/or 0.5 mg/mL PAMAM dendrimer. After incubation with the treatments for 1h at 37°C, cells were washed twice in PBS (pH 7.4) or pH-adjusted PBS (pH 6.4) and imaged in each buffer containing 1 μL of DRAQ5 nuclear stain (Axxora, San Diego, CA). DRAQ5 was excited with 633 nm laser and images of cell nuclei were obtained using an Olympus FV1000 confocal microscope (Olympus, Japan) using 60× objective.