Supplementary information

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1. Cell preparation

1.1. *Cell culture*

For the cell transfection experiments Colon carcinoma cells, RKO, were cultured in Dulbecco's Modified Eagle Medium (DMEM) (Gibco, Grand Island, NY, USA). Then they were supplemented with 10% fetal bovine serum and 100 units/mL penicillin, 100 g/mL streptomycin and 0.25 g/mL amphotericin B (all HyClone, Logan, UT, USA). Prior to the experiments they were placed in a NuncTM six-well plate and allowed to grow overnight in an incubator with a temperature of 37 °C and 5 % CO2 to let the cells attach to the surface of individual wells. With this procedure we obtained 80-90% confluency per well.

1.2. *Molecular delivery*

Two fluorescent molecules were used to investigate the cell membrane poration: Calcein (623 Da, Stokes radius 0.6-0.7 nm, λ_{exc}= 490 nm, λ_{em} = 520 nm, Sigma-Aldrich, St. Louis, USA) and FITC-Dextran (10.000 Da, Stokes radius 2.3 nm, λ_{exc} = 490 nm, λ_{em}= 520 nm, Sigma-Aldrich, St. Louis, USA), henceforth referred to as Calcein and FITC-Dextran respectively. Both solutions were then dissolved in 99.9% anhydrous Dimethyl sulfoxide (DMSO) (Sigma-Aldrich, St. Louis, USA) and DI water, respectively, to obtain stock solutions of 100 mg/mL. Before the experiments were conducted, the stock solutions were further diluted with culture medium to final concentrations of 0.3 mg/mL for Calcein and 2.0 mg/mL for FITC-Dextran. The cells in the wells were then washed once with 1x phosphate buffered saline (PBS) (Gibco, Grand Island, NY, USA) and 200 μL of the working solution containing Calcein or FITC-Dextran was added to the cells with droplets to achieve homogeneous spreading of the working solution over the cells.

1.3. *Molecular uptake evaluation*

We evaluate the molecular uptake of Calcein and FITC-Dextran by the cells with an inverted microscope (Olympus, IX71) with a 4x or 10x microscope objective. Fluorescence was excited with a mercury lamp (U-RFL-T, Olympus) and observed with an appropriate filter block (U-FBN, Olympus, band pass excitation filter 470 nm $< \lambda <$ 490 nm, long band pass emission filter $\lambda >$ 510 nm. Still images were recorded using a monochrome digital 12-bit CCD camera (Sensicam QE). The exposure time of the images captured for calcein and FITC-Dextran were set to $t_e = 0.105\,\mathrm{s}$ and $t_e = 2.175\,\mathrm{s}$, respectively.