Supporting Information

The interactions of single-wall carbon nanohorns with polar epithelium

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Figure S1. The energy dispersive spectrum of agSWCNHs and SWCNHox.



Figure S2. A, FTIR spectrum of agSWCNHs and SWCNHox. Black arrows indicate the additional absorption peaks besides the original ones; B, Particle size distribution of suspensions of agSWCNHs and SWCNHox in distilled water with 10 mg mL⁻¹ BSA as suspending agent by dynamic light scattering analysis; C, Zeta potentials of agSWCNHs and SWCNHox in distilled water with 10 mg mL⁻¹ BSA as suspending agent.



Figure S3. Fluorescence CLSM images of DMEM (control, A) and F-B-SWCNHox (B) suspensions in DMEM; (C) Fluorescence spectrum of F-B-SWCNHox in DMEM.



Figure S4. Cell viability was detected by CCK-8 assays after incubation with inhibitors and 100 µgml⁻¹ SWCNHox for 3h. Untreated cell was used as the control.

| z00 | z01 | z02 | z03 | z04 | z05 | z06 | z07 | z08 | z09 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| z10 | z11 | z12 | z13 | z14 | z15 | z16 | z17 | z18 | z19 |
| z20 | z21 | z22 | z23 | z24 | z25 | z26 | 227 | z28 | 229 |
| z30 | 231 | 232 | 733 | z34 | z35 | z36 | 237 | z38 | z39 |
| z40 | z41 | z42 | z43 | z44 | z45 | z46 | z47 | z48 | z49 |
| z50 | z51 | z52 | z53 | z54 | z55 | z56 | z57 | z58 | z59 |

Figure S5. Confocal image series of MDCK cell monolayer along the Z-axis after incubation with 40 μ g ml⁻¹ F-B-SWCNHox suspensions for 12 h at 37°C. Green represents F-B-SWCNHox, blue represents nuclei, red represents the pseudo-color of transwell membrane.

| у00 | y01 | y02 | y03 | y04 | γ05 | у06 | y07 | γ08 | γ09 | y10 | y11 |
|---|------------------------|--------------------------------------|---|---------------------------|------------------------------|-------------------|--------------|---|----------------------|--------------------------|------------------------|
| y12 | y13 | y14 | y15 | y16 | y17 | y18 | y19 | γ20 | y21 | y22 | y23 |
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| y24 | y25 | y26 | y27 | y28 | y29 | y30 | y31 | y32 | y33 | y34 | y35 |
| v36 | v37 | v38 | v39 | v40 | v41 | v42 | v43 | v44 | v45 | v46 | v47 |
| | erer gifte fligte og å | inclusion and | erenteri er bage føre | | a tupon compiliya | at pro 1 8401 (1) | | | become an along per- | 66 (1077) 10 (1089) 10 (| antin stranger |
| y48 | y49 | y50 | y51 | y52 | γ53 | γ54 | γ55 | γ56 | y57 | y58 | γ59 |
| | | | | | | | | 1.0 m () () () () () () () () () (| | | |
| у60 | y61 | уб2 •••• 24.07 • ••• • | y63 | y64 | y65 | y66 | y67 | y68 | y69 | y70 | y71 |
| y72 | v73 | v74 | y75 | y76 | y77 | y78 | y79 | y80 | y81 | y82 | v83 |
| - | | - | - | | | asoby, | | | | | - |
| y84 | y85 | y86 | y87 | y88 | y89 | y90 | y91 | y92 | y93 | y94 | γ95 |
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Figure S6. Confocal image series of MDCK cell monolayer along the Y-axis after incubation with 40 μ g ml⁻¹ F-B-SWCNHox suspensions for 12 h at 37°C. Green represents F-B-SWCNHox, blue represents nuclei, red represents the pseudo-color of transwell membrane.



Figure S7. The TEER value changes of MDCK cell monolayers incubated with (A) different types of SWCNHs for different time periods at the concentration of 20 μ gml⁻¹, (B) different concentrations of SWCNHox for different time periods, (C) different inhibitors used in endocytosis pathway study, and the influence of 100 μ g ml⁻¹ SWCNHox on TEER was determined simultaneously.

| Element assay | C% | N% | Н% |
|---------------|------|-------|--------------|
| agSWCNHs | 95.3 | 4.23 | Not detected |
| SWCNHox | 91.5 | 0.564 | 0.728 |

Table S1 Results of elemental analysis

| Table S2 Characteristic | of agSWCNHs and | SWCNHox in different media |
|-------------------------|-----------------|----------------------------|
|-------------------------|-----------------|----------------------------|

| sample | Medium | Centrifugation (rpm) | Time of repose (h) | Particle Size(d.nm) | PDI |
|----------|----------------|-------------------------|-----------------------|------------------------|-------------|
| agSWCNHs | water | | 0 | 2155.3±348.0 | 0.881±0.131 |
| agSWCNHs | water with BSA | 12 thousand | 0 | 220.5±10.9 | 0.230±0.019 |
| agSWCNHs | water with BSA | 12 thousand | 48 | 210.1±12.1 | 0.308±0.037 |
| agSWCNHs | PBS with BSA | 12 thousand | 0 | 191.4±8.55 | 0.295±0.019 |
| agSWCNHs | PBS with BSA | 12 thousand | 48 | 224.2±14.1 | 0.331±0.004 |
| SWCNHox | water | | 0 | 465.4±13.5 | 0.840±0.122 |
| SWCNHox | water with BSA | 12 thousand | 0 | 139.6±2.87 | 0.214±0.01 |
| SWCNHox | water with BSA | 12 thousand | 48 | 183.2±4.05 | 0.270±0.020 |
| SWCNHox | PBS with BSA | 12 thousand | 0 | 161.3±9.77 | 0.265±0.027 |
| SWCNHox | PBS with BSA | 12 thousand | 48 | 239.0±1.38 | 0.270±0.020 |