## Supplementary information, Materials and Methods

### Patients and histology

The colon tissues were collected from ten HIV-infected patients with available clinical history, at the Gastroenterology Department of the Youan Hospital in Beijing. The specimens were formalin-fixed and paraffin-embedded. Specimens from HIV-infected patients were stained following standard immunostaining procedures. For calculation of cell-in-cell frequency per sample, cells from three 40x magnification fields were counted, and cell-in-cell frequency was displayed as the mean ± SEM of three different samples per field. Informed consent was obtained for all tissue samples linked to the clinical data.

### Cells

Five cell lines were used in this study (Table 1). They were grown in RPMI 1640 medium (GIBCO BRL) or Dulbecco's modified Eagle's medium (GIBCO BRL) supplemented with 10% fetal bovine serum (FBS) and antibiotics. Cultures were passaged by treating the cells with 0.25% trypsin–1 mM EDTA–phosphate-buffered saline (PBS; pH 7.2) solution and plating them by the ratio of 1:10 twice a wesek. When necessary, cells were dislodged by treatment with 2 mM EDTA-PBS.

Table1. Cells used in this study

| Cell line | Origin | Source |
|---|---|---|
| Caco2 | Human colon carcinoma | ATCC |
| MCF-7 | Human breast adenocarcinoma | ATCC |
| PLC/PRF/5 | Human hepatocellular carcinoma | ATCC |
| H9 | Human T lymphocyte | Yongtang Zheng |
| H9/IIIB | Human T lymphocyte that produce Human T cell leukemia virus III (HTLV III) | Yongtang Zheng |

### Cell internalization assays

Target monolayer cells stained with CellTracker Red were trypsinized to a single-cell suspension and plated on 24-well plates at $4\times 10^4$ cells per well in full medium. The next day, H9 or H9/IIIB cells stained with CellTracker Green of $4\times 10^5$ cells in 0.5 ml culture medium per well were added into each well. Cells were incubated at 37℃, 5% $CO_2$ for the indicated times, and then washed in PBS and detached, and adherent cells were collected and fixed with 4% paraformaldehyde. Cell internalization rate were counted by optical microscopy on a Leica AF7000 fluorescence microscope using a 63×1.3 numerical aperture PlanApo objective. Figures were constructed using Adobe Photoshop. H9/IIIB cells surrounded by target cells, at least 50%, were considered to be internalized. Percentages were calculated from a total of 200 cells in at least three independent experiments.

**Immunostaining**

For immunostaining, target cells were seeded onto sterile, acid-treated 12 mm coverslips in 24-well plates (Corning Glass Works, Corning, NY, USA) and then incubated with H9/IIIB cells before settling on coverslips. Cells were firstly permeabilized in PBS containing 0.25% Triton X-100 for 10 min at room temperature, then briefly washed with PBS followed by blocking in PBS containing 5% BSA (Fraction V, Sigma) for one hour. After that, cells were incubated with individual primary antibodies in PBS containing 5% BSA in a humidified chamber for 1 h, and then washed three times in PBS. Slides were then incubated with Alexa Fluor-labeled secondary antibodies (Life Technologies, Carlsbad, CA) for 1 h at room temperature, and mounted with ProLong Diamond Antifade Mountant with DAPI (Life Technologies, Carlsbad, CA). Images were taken with a confocal laser-scanning microscope (model LSM 510; Carl Zeiss, Inc.) using a 63×1.3 numerical aperture PlanApo objective. Figures were constructed using Adobe Photoshop.

**Transmission electron microscopy (TEM) sample preparation**

For electron microscopy, cells were fixed in a mixture of 3% glutaraldehyde in 0.1 M PB (pH7.4) at room temperature for 2 hrs, and post-fixed with 1% osmiumtetroxide in

0.1% PB. After dehydration through an ethanol series, the specimens were embedded in Araldite-Epon (Embed-812, Electron Microscopy Sciences, Hatfield, PA). Ultrathin sections were then prepared with an ultramicrotome (Leica, Deerfield, IL). Pale-gold sections were collected on 200 mesh copper grids. Ultrathin sections were stained with uranyl acetate and lead citrate (Electron Microscopy Sciences) and examined with an electron microscope (Hitachi, Hitachi, JP).

**Enzyme-linked immunosorbent assay (ELISA)**

For ELISA, target cells ($1\times10^5$) were co-cultured with H9/IIIB cells ($5\times10^5$) for 24 hrs in 12-well plates. To remove H9/IIIB cells, target cells were washed, trypsinized, and cultured in 6-well plates. Cells were washed by PBS and fresh media were added every 24 hrs. Supernatants were collected at day 5 and applied to ELISA for p24 detection by using HIV-1 p24 detection kit made by Hebei Medical University, China. P24gag in kit and the supernatant of H9 were used as positive control and negative control, respectively.