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Canine and feline parvoviruses can use human or feline transferrin receptors to bind, enter, and infect cells.

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Canine parvovirus (CPV) enters and infects cells by a dynamin-dependent, clathrin-mediated endocytic pathway, and viral capsids colocalize with transferrin in perinuclear vesicles of cells shortly after entry (J. S. L. Parker and C. R. Parrish, J. Virol. 74:1919-1930, 2000). Here we report that CPV and feline panleukopenia virus (FPV), a closely related parvovirus, bind to the human and feline transferrin receptors (TfRs) and use these receptors to enter and infect cells. Capsids did not detectably bind or enter quail QT35 cells or a Chinese hamster ovary (CHO) cell-derived cell line that lacks any TfR (TRVb cells). However, capsids bound and were endocytosed into QT35 cells and CHO-derived TRVb-1 cells that expressed the human TfR. TRVb-1 cells or TRVb cells transiently expressing the feline TfR were susceptible to infection by CPV and FPV, but the parental TRVb cells were not. We screened a panel of feline-mouse hybrid cells for susceptibility to FPV infection and found that only those cells that possessed feline chromosome C2 were susceptible. The feline TfR gene (TRFC) also mapped to feline chromosome C2. These data indicate that cell susceptibility for these viruses is determined by the TfR.

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