Identification of an alternative cell line permissive to porcine epidemic diarrhea virus infection and replication

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Vero cell line has been routinely used for isolation and propagation of porcine epidemic diarrhea virus (PEDV) and is the most studied cells in the literature. However, isolation of PEDV in Vero cells has been proven difficult. Besides, the entry mechanism for PEDV in Vero cells is also known to be the cellular receptor (porcine aminopeptidase; pAPN; CD13)-independent suggesting that Vero cells might not be a suitable cell line for studying the interaction of PEDV with its receptor or the viral entry pathway. In the present study, a HEK 293 cell line stably expressing pAPN (HEK-pAPN) has been established. The susceptibility of the HEK-pAPN cell line to PEDV infection has been compared with Vero cells, HEK293 cells and PK-15 cells. Interestingly, similar to PEDV-infected Vero cells, cytopathic effects characterized by cell fusion, formation of multinuclear syncytial cells and cell death were observed in HEK 293 and HEK-pAPN cells after 48 hours of inoculation, but not in the PK-15 cells. Furthermore, both HEK 293 and HEK-pAPN cell lines permissive to PEDV infection confirmed by immunocytochemistry (ICC) staining, one-step growth curve and real-time PCR have found to express the APN protein. In conclusions, we have demonstrated that HEK293 cells carrying APN molecules are permissive to PEDV. The HEK293 cell line might serve as an alternative tool that could be used to study PEDV pathogenesis and entry mechanisms. Furthermore, the identification of the human origin HEK293 cell line permissive to PEDV raises the possibility of interspecies transmission of the virus is of concern.

Biography

Ching Yang is currently a Veterinary Student from National Taiwan University who has strong interest in veterinary pathology. She is actively involved in research programs in Taiwan and abroad and she has also presented her work in both international and national conferences.

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