DEVELOPMENT OF PORCINE INTESTINAL EPITHELIAL CELL CULTURE MODEL FOR ENCEPHALITOZOOZON INTESTINALIS INFECTION

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ABSTRACT

Microsporidiosis is an emerging and opportunistic infection especially in AIDS and cancer patients, organ transplant recipients and elderly people. Encephalitozoon intestinalis is an obligate intracellular parasite and the second most prevalent disseminating microsporidian infecting humans. E. intestinalis first infects enterocytes and further spread to various other organs including kidney, lungs and liver. No animal models closely related to humans and show clinical signs of this infection have been described so far. As a first step to develop a porcine infection model, we compared the infectivity of porcine and human intestinal epithelial cultures to E. intestinalis. Two porcine intestinal epithelial cell lines IPEC-J2 and IPEC-1 derived from jejunum and small intestine respectively, and a human colon cell line Caco-2 were grown in DMEM medium supplemented with fetal calf serum, insulin, transferrin, selenium, epidermal growth factor and antibiotics. A quantitative cell culture infectivity assay was used to compare the infectivity of different cell cultures each day up to 6 days post-infection. The method employed microscopical observation of intracellular spore masses after staining with optical brightener calcofluor white and a FITC-linked polyclonal E. intestinalis specific antibody. Both porcine and human cell lines showed significant infection with E. intestinalis by the second day. The infectivity and replication kinetics of E. intestinalis in both porcine and human cells were further compared and quantified using flow cytometry and real time PCR assays. The data support the hypothesis that E. intestinalis infects porcine intestinal epithelial cell cultures and pigs may prove as a good animal model for human E. intestinalis studies.