

Neuropathogenesis in cytomegalovirus infection

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The brain is the main target in congenital cytomegalovirus (CMV) infection and immunocompromised patients. We have developed model systems for brain abnormalities induced by murine cytomegalovirus (MCMV). Neuroepithelial cells were the most susceptible sites to MCMV infection in the embryonic brains and in brain slice cultures infected with MCMV. Neurospheres, including neural stem/progenitor cells, were susceptible to MCMV infection with suppression of their growth and differentiation. In the early phase of infection, glial cells in ventricular walls of the developing brains tended to express the immediate-early (e1) gene with viral replication, while in the prolonged phase, expression of the early MCMV e1 gene was persistent in the neuronal cells. Neuron-specific expression of the e1 gene-promoter was observed in transgenic mice. MCMV-infected neurons evaded the innate immunity to MCMV, leading to persistent infection. The persistent infected neurons showed the reduced expression of the NMDA receptors, probably causing functional disorders of brain.