Sheep-associated malignant catarrhal fever (SA-MCF) caused by ovine herpesvirus-2 (OvHV-2) is a fatal disease associated with lymphoproliferation, lymphocytic vasculitis, and mucosal ulceration in susceptible species, and American bison (Bison bison) are particularly susceptible. The pathogenesis of MCF is poorly understood.

Six captive bison were infected by nasal aerosolization with OvHV-2. Leukocytes in vascular lesions were phenotyped by indirect polychromatic immunofluorescence on cryosections of urinary bladder, kidney, and liver. Vascular lesions were localized using von Willebrand’s factor, an endothelial marker, and a single leukocyte marker (CD2, CD3, CD4, CD8α, CD25, CD79α, CD335/NKp46, WC1, CD14, calprotectin, or TCR1-N24 delta chain) determined which immune cell subtypes were consistently present. Concurrent detection of three lymphoid cell markers allowed further phenotyping.

CD8+/perforin+ gammadelta T cells, CD4+/perforin- alphabeta T cells, and B cells consistently infiltrated vascular lesions in the urinary bladder, kidney, and liver of all six bison. CD2+ cells labeled with either CD4 or delta chain, indicating that all cytotoxic lymphoid populations were identified. CD8+ alphabeta T cells, NK cells, macrophages, and WC1+ gammadelta T cell cells were not consistently identified.

Previously, detection of CD8+ cells in the vascular lesions of cattle and bison was interpreted as cytotoxic alphabeta T cells since WC1+ cells were not identified. However, this study identified CD8+/perforin+ WC1- gammadelta T cells and CD4+/perforin- alphabeta T cells within vascular lesions of bison. These cell types have the potential for cytotoxicity and/or regulatory function, and both may contribute to the pathogenesis of MCF.