Evidence suggests that $CD8^+$ T cells can contribute to the pathology of multiple sclerosis (121,122,123). If $CD8^+$ T cells contribute to the pathology of multiple sclerosis, it is likely that the mechanisms include damage to nerve tissue in the CNS by way of secretion by $CD8^+$ T cells of perforin and granzyme (124,125).

d. DCs Present Antigen to T Cells and Activate the T Cells

Prior to attack of $CD4^+$ T cells or $CD8^+$ T cells on components of the CNS, these T cells must be activated to recognize antigens of the CNS. DCs are required for the full activation of $CD8^+$ T cells and $CD4^+$ T cells. DCs are present within the healthy CNS (126). Therefore, the sampling of CNS antigens by DCs likely plays an integral role in CNS immunity. The term "sampling" generally refers to the DC's uptake of antigens from the physiological environment, followed by processing them to forms that can bind to the DC's MHC, followed by binding of the processed antigens to the MHC. Sampling may be followed by the DC's formation of an immune synapse with a T cell, where the processed antigen (held in place by the DC's MHC) is presented to the T cell. DCs are also found within lesions of multiple sclerosis.

e. Breakdown of the Blood–Brain Barrier

At later stages of multiple sclerosis, there is a massive influx of immune cells at the lesion in the CNS, including T cells, B cells, and macrophages. In human lesions of multiple sclerosis, macrophages and $CD8^+$ T cells also inflict damage on blood vessels, where the result is a breakdown of the *blood–brain barrier*, and where this breakdown permits an ever greater influx of immune cells from the circulatory system into the CNS (127).

f. Toxic Oxygen From Microglia

Microglia, which are macrophage-like cells that reside only in the CNS, also contribute to the lesions of multiple sclerosis (128). Normally, microglia function to protect the CNS against infections, but in multiple sclerosis, microglia

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