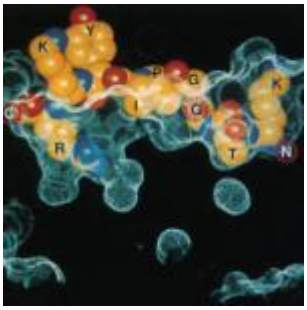
A new marker denotes exhausted CD8+ T cells during chronic viral infections



Persistent viruses induce a state of chronic viral infection that is characterized by inducing a state of T cell dysfunction, or exhaustion. Identifying these cells can be important for developing treatments to mitigate the immune disabling effects of chronic infections, such as HIV. In the recent edition of PloS Pathogens, Gupta and colleagues report that the ectonucleotidase CD39 is expressed by T cells specific for chronic viral infections in humans and in a mouse model. CD39 hydrolyzes extracellular ATP and ADP into adenosine monophosphate, which is then processed into adenosine by CD73.

Adenosine is a potent immunoregulator that binds to A2A receptors and prevents T cell activation and NK cytotoxicity. It is rarely expressed on T cells following clearance of acute infections. In the mouse model of chronic viral infection, CD39 demarcates a subpopulation of dysfunctional, exhausted $CD8^+$ T cells with the phenotype of irreversible exhaustion. The authors conclude that CD39 expression identifies terminal $CD8^+$ T cell exhaustion and is involved in the regulation of exhaustion.

Gupta, P. et al. 2015. CD39 Expression Identifies Terminally Exhausted CD8+ T Cells. *PLOS*.