May 20th, 12:30 PM

A Novel Population Of Natural Killer Cells Pplays A Critical Role in the Depletion of Splenic B2 B Cells During Experimental African Trypanosomiasis

Deborah Frenkel
University of Massachusetts Amherst, dfrenkel@vasci.umass.edu

Samuel J. Black
University of Massachusetts Amherst

A NOVEL POPULATION OF NATURAL KILLER CELLS PLAYS A CRITICAL ROLE IN THE DEPLETION OF SPLENIC B2 B CELLS DURING EXPERIMENTAL AFRICAN TRYPANOSOMIASIS

Deborah Frenkel PhD[1] Samuel J Black PhD[1]
1 University of Massachusetts, Department of Veterinary and Animal Sciences

Mice infected with Trypanosoma brucei, the causative agent of human sleeping sickness and a contributor to nagana in cattle, rapidly lose the capacity to mount VSG-specific antibody responses, and die with uncontrolled parasitemia. We have shown (Bockstal et al., 2011, PLOS Pathogens) that the loss of humoral immune competence in the infected mice results from depletion of developing and mature splenic B cells. We now report that T. brucei-induced splenic B cell depletion is dependent upon the presence of the pore forming molecule perforin which is present in the cytotoxic granules of cytotoxic T lymphocytes, natural killer T cells and natural killer cells, occurs in the absence of T cells (and natural killer T cells), i.e., in T cell receptor (αβγδ)-/- mice, but does not occur in intact mice that are depleted of natural killer (NK) cells by treatment with monoclonal antibody specific for the NK1.1 differentiation antigen. In the intact mice, B cells are deleted after remission of the first T. brucei parasitemic wave. At this time natural killer cells are expressing the cytotoxic granule marker CD107a, indicating that they have degranulated, executing their effector function. Moreover, in vitro assays show that B cells from T. *brucei* infected mice are killed by natural killer cells from uninfected C57BL/6 mice but not efficiently killed by CD107a positive natural killer cells isolated from infected mice, which may be functionally exhausted.

Deborah Frenkel, Ph.D.
University of Massachusetts
Veterinary & Animal Sciences
460 Integrated Sciences Building
Amherst, MA 01003
413 522 6066
dfrenkel@vasci.umass.edu