Retrovirology

BioMed Central

Oral presentation

Preferential depletion of a splenic marginal zone-like peripheral blood CD27+B220- memory B cell population in HIV-1 infected individuals

M Morrow[1], A Valentin[1], R Little[2], R Yarchoan[2] and GN Pavlakis*[1]

Address: [1]Human Retrovirus Section, Vaccine Branch, Center for Cancer Research, National Cancer Institute at Frederick, Frederick Maryland, USA and [2]HIV and AIDS Malignancy Branch, Center for Cancer Research, National Cancer Institute, Bethesda, Maryland, USA

* Corresponding author

from 2006 International Meeting of The Institute of Human Virology
Baltimore, USA. 17–21 November, 2006

Published: 21 December 2006

Retrovirology 2006, **3**(Suppl 1):S97 doi:10.1186/1742-4690-3-S1-S97

In addition to CD4+ T cell depletion, HIV-1 infection is characterized by changes in humoral immunity including hypergammaglobulinemia, polyclonal B cell activation and loss of circulating memory B lymphocytes. Expression of the CD45 isoform B220 has recently been described on CD27- and a subset of CD27+ human B lymphocytes. The aim of this study was to evaluate B cell defects in HIV infection in more detail. We studied the frequency of memory B cells, based on the expression of B220, in HIV infected individuals (n = 27) and healthy controls (n = 22) and characterized their functional properties. RNA expression of TLR9 and activation-induced cytidine deaminase (AICD) was analyzed by Real-time PCR from B cells sorted according to their memory phenotype. In addition, B-cell proliferative responses and immunoglobulin secretion in response to SAC and ODN treatment were monitored.

We found that the previously described reduction in the frequency of CD27+ B cells in HIV-infected individuals affects preferentially the subset characterized by the lack of B220 expression. The proportion of CD27+B220- B cells expressing surface IgD (28.8%) and IgM (29.5%) was reduced in the HIV+ group compared to healthy controls (53.9% and 59.8%, respectively). This depletion did not correlate with either CD4 counts or viral load, and was not reversed by antiretroviral therapy. We found that CD27+B220- B cells have a splenic marginal zone like immunophenotype (IgMhiIgDloCD21+CD23-), express TLR9, and proliferate and secrete IgG and IgM in response to B cell specific ODN. In contrast, CD27+B220+ B cells are IgMloIgDhiCD21+CD23+, express AICD and proliferate in response to SAC but do not secrete immunoglobulins.

The lack of B220 expression on CD27+ B cells defines a distinct memory B cell compartment that is preferentially depleted in HIV-infected individuals. The phenotype, pattern of gene expression and functional properties of the preferentially depleted CD27+B220- B cells suggest that these cells are splenic marginal zone-like circulating memory B cells. The lack of these cells in HIV patients may play an important role in the defective immunity against T-independent pathogens and may impair the humoral control of HIV-1 propagation.