No linkages between distributional and functional diversities of NK cells in different immune organs with the sizes of intracellular SIV DNA and RNA in regional resting CD4+ T cells in chronically SIVmac239-infected, treatment-naïve rhesus macaques

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Abstract

Natural killer (NK) cells play an important role in the control and even eradication of viral infections. Accumulated studies have shown that NK cells may clear HIV-1-infected cells through natural cytotoxicity or antibody-dependent cellular cytotoxicity (ADCC) ex vivo or in vitro. However, NK cell-directed HIV therapeutic strategies still remain elusive. In the present study, we verified that intracellular HIV DNA load in reactivated HLADR-CD4+ T cells could be significantly inhibited by soluble factors produced by activated NK cells in vitro. Furthermore, bulk NK cells and the cytotoxic CD16+CD56- subset in peripheral blood exhibited higher frequency, cytotoxic potentials, and IFN-γ-producing capacity than that in spleen and LNs. No discrepancies of intracellular SIV DNA or RNA level in resting CD4+ T cells were found among blood, spleen and LNs. Specially, no associations were found between distributional, functional and phenotypic diversities of NK cells and the sizes of intracellular SIV DNA or RNA in regional resting CD4+ T cells in peripheral blood, spleen and LNs. The only difference is that the ratios of SIV DNA/RNA among different organs were positively correlated with NK frequencies in lymphocytes. These results indicated that NK cells may play an inhibitory role on re-activation of latent SIV DNA, while fail to influence the long-term cumulative size of SIV latent DNA or RNA in regional lymphocytes in vivo. Our study suggests NK cell-directed treatment options aiming at HIV clearance still face big challenges.

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