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Possibility of γδ T cell immunotherapy for HTLV-1-infected individuals

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γδ T cells, a small subset of T lymphocytes, are involved in innate immunity. It has been demonstrated that γδ T cells have cytotoxic activities against cells infected with a variety of viruses. However, there is little evidence suggesting a cytotoxic activity of γδ T cells against HTLV-1-infected cells. Therefore, we investigated whether γδ T cells play a protective role in the defense against HTLV-1.

Using PBMCs from asymptomatic carriers (ACs) and HAM/TSP patients, we assayed the frequency of CD3+Vγ9+ (γδ T) cells and the correlation between its frequency and the HTLV-1 load. The frequency of γδ T cells was significantly decreased in HAM/TSP patients compared with that in ACs. The frequency of γδ T cells was inversely correlated with the proviral load. These results suggest that γδ T cells have a protective effect on HTLV-1-infected individuals. Next, CD3+Vγ9+ cells and CD3+Vγ9- cells were separated from PBMCs of HTLV-1-infected persons by FACS and the proviral load of each population was quantified by real-time PCR. The proviral load in γδ T cells was markedly lower than that in CD3+ lacking γδ T cells. Furthermore, we cultured PBMCs from HTLV-1-infected individuals in the presence of IL-2 and zoledronate. In some cases, the majority of cells contained in these cultures became γδ T cells and the proviral load was markedly decreased. The cultured PBMCs showed strong cytotoxic activities against a HTLV-1-infected cell line as well as an ATL cell line. These results raise the possibility of γδ T cell immunotherapy in HTLV-1-infected individuals.

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