

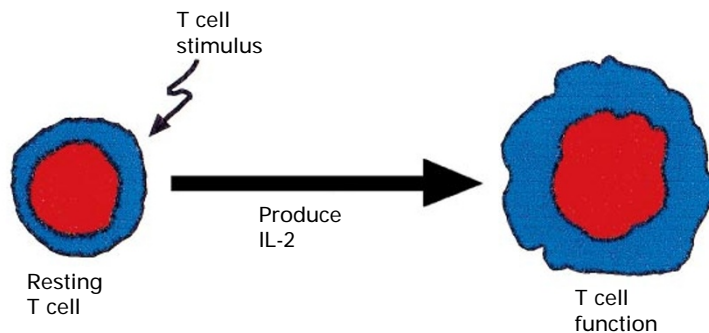
## Educational Corner

# Apoptotic T cell death in HIV/AIDS

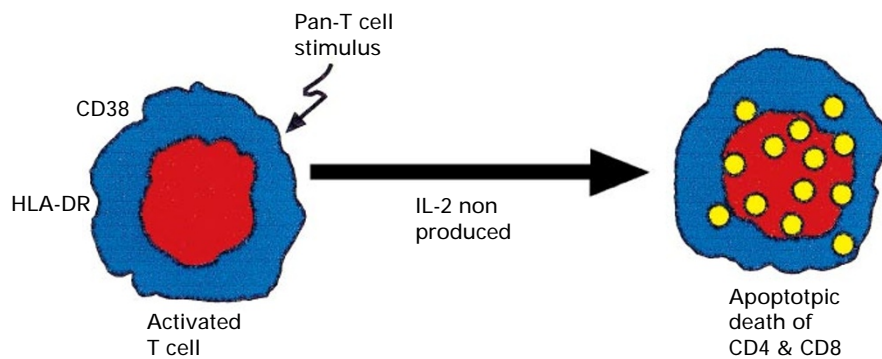
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### HIV- donor:



### HIV+ donor:



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Apoptotic T cell death may play an important role in the progression of HIV infection to AIDS. Experimental observations suggest that T lymphocytes of HIV-infected individuals produce less type 1 cytokines (including IL-2 and IL-12) and more type 2 cytokines (including IL-10).

Data have shown that type 1 cytokines reduce apoptotic death of HIV-infected lymphocytes induced in vitro by at least three different methods: gp120-CD4 cross-linking, CD3-TcR activation, and IL-2 deprivation. In contrast, type 2 cytokines have either no effect or enhance apoptotic death of lymphocytes of HIV-infected individuals.

The model shown predicts that, whereas T lymphocytes of HIV-seronegative individuals are mostly in a resting situation and produce IL-2 upon antigenic stimulation, exposure of CD4 T cells to HIV or HIV products activate T cells for a second death-inducing stimulus, resulting in extensive apoptotic T cell death.

These non-infectious interactions between CD4 cells and HIV or its products contribute to the depletion of CD4 T cells without the need for infection of such cells. This

mechanism would result in pan-depletion of activated T cells expressing a broad spectrum of antigen specificities. The observation that type 1 cytokines are reduced, whereas type 2 cytokines are augmented in HIV infection accounts for the continuous and massive destruction of CD4 lymphocyte leading to the appearance of AIDS.

## Further reading

- Clerici M and Shearer GM (1994a) The TH1/TH2 hypothesis of HIV infection: new insights. *Immunol Today* 15:575-581.
- Estaquier J, Idziorek T, Zou W, Emilie D, Farber C-M, Bourez J-M and Ameisen J-C (1995) T helper 1/T helper 2 cytokines and T cell death: preventive effect of IL-12 on activation-induced and CD95 (Fas/Apo-1)-mediated apoptosis of CD4+ T cells from human immunodeficiency virus-infected person. *J. Exp. Med.* 182:1759-1767.
- Finkel TH, Tudor-Williams G, Banda NK, Cotton MF, Curiel T, Monks C, Baba TW, Ruprecht RM and Kupfer A (1995) Apoptosis occurs predominantly in bystander cells and not in productive cells of HIV- and SIV-infected lymphnodes. *Nature Med.* 1:129-134.