Higher IL-6 Concentration Correlates with Higher HIV-1 Infection Rate in Resting CD4+ T Cells

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Abstract

CD4+ resting T cells are highly resistant to HIV infection in vitro. When they are exposed to endothelial cells the infection rate significantly increases. Previous research suggests that there is a correlation between IL-6, a cytokine secreted by endothelial cells, and HIV infection rate in CD4+ resting T cells. Using ELISA techniques, we found that HIV infection occurs more commonly with a higher IL-6 concentration within the supernatant. Memory T cells secrete more IL-6 than naïve T cells and also produce a higher infection rate. Additionally, the endothelial cells with which the T-cells are cultured seem to secrete a variable amount of IL-6. Human Umbilical Vein Endothelial Cells (HUVECs) secrete a significantly higher concentration of IL-6 than Lymphatic Endothelial Cells (LECs). This affirms previous research showing that HUVECs induce higher infection rates than LECs. While IL-6 appears to be strongly correlated with infection rate, we also showed that while IL-6 was completely blocked using antibodies, infection still occurred, albeit at a lower rate. This suggests that there are additional mechanisms used to induce infection.

Introduction

HIV-1, the virus that leads to AIDS, is a worldwide problem affecting nearly 40 million people worldwide. It selectively infects CD4+ T cells and forms latent vectors which makes the virus particularly difficult to treat. (1) To make matters more complicated, HIV can infect a limited amount of Resting CD4+ T cells without prior activation. More recently Choi et al demonstrated that endothelial cells, the cells that line human blood vessels and have frequent contact with Resting CD4+ T Cells, seem to have a positive effect on the infection of Resting CD4+ T Cells. (2,3) Shen et al further demonstrated that ECs have the ability to increase both productive and latent infection rates. (4) IL-6 was determined to be a key cytokine in this process.

Results

The results from the data can be summarized into two main points:

• CD4+ Resting Memory T Cells secrete a higher concentration of IL-6 than do Naïve cells and also display a higher infection rate.

• HUVECs secrete a higher concentration of IL-6 than do LECs and also induce a higher infection rate in Resting CD4+ T Cells

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