CD38 & PD1 Expression In HIV-1 Infected resting CD4+ T Cells
Wei Wang And Dr. Anding Shen, Calvin College

Motivation

Generally, HIV-1 infects activated CD4+ T cells but not resting CD4+ T cells. Highly active antiretroviral therapy (HAART) is able suppress HIV-1 infection to undetectable levels in the majority of patients. However, eradication can’t be achieved because latent viral reservoirs persist. It’s believed that latent viral reservoirs formed after infected activated CD4+ T lymphoblasts return to the resting state. However, a recent interesting finding validated that endothelial cells co-cultured resting T cells can be directly infected by HIV-1. Is it possible that latent reservoirs come from the infected resting CD4+ T cells? Are the infected resting T cells express activation markers differently?

Background & Objectives

backgrounds
- Previous studies demonstrated endothelial cells (EC) co-cultured resting T cells can be productively infected while remaining in the resting state. This means the major activation markers (CD25, CD69, and HLA-DR) on the T cells are not expressed.
- It’s not understood how HIV-1 penetrates resting CD4+ T cells.

Objectives
- Check if infected resting CD4+ cells express higher CD38 or PD1 activation marker(s).
- Hypothesize how HIV-1 penetrates resting CD4+ T cells.

Methods

General Scheme Of EC and CD4+ T cell co-culture and HIV-1 infection
- Endothelial cells (+/- MHC II) and CD4+ T cells (activated and resting) are co-cultured. So there are four different plates
- Use CD38 and PD1 antibodies to stain CD4+ T cells in every culture
- Flow cytometer is a powerful tool to detect the presence of the antibodies.

Results

CD38 and PD1 expression

Among all the CD38+ (or CD38-, PD1+, PD1-) cells, what percentages are GFP+?

Among all the GPF+ (infected) cells, what percentages are CD38+, CD38-, PD1+, PD1-?

Conclusions

1. Infected cells don’t have significant higher CD38 or PD1 expression.
2. CD38+ and CD38- cells have about the same percentage of infection rate. PD1+ cell has higher infection rate than PD1- cells. From resting cell culture to EC+ cell culture, infection rate increases in any activation mark expression.
3. Like activated cells, EC- and EC+ cultured resting cells infection are predominately CD38+.
4. PD1 expression in EC- and EC+ cultures were different from activated culture but conclusion can’t be drawn because the proportion of PD1 infected resting T cells was too small.

References


Acknowledgment

I want to thank Dr. Shen the opportunity to do this research. I also thank the NIH grant and Calvin College’s facilities. Thank my colleagues for their advices and lab instructions. (they are Marry, John, and Anne)