

## The Role of Endothelial Cells on HIV-1 Infection of CD4+ Resting T Cells

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HIV, the virus that leads to AIDS, is a worldwide problem affecting nearly 40 million people worldwide. Although there has been year of research poured into understanding this virus, we still don't fully understand how the virus interacts with the body's cells under different conditions. Recently, we have discovered that endothelial cells, the cells that line the body's circulatory system, may have a role in the infection of CD4+ resting T cells. These cells are not normally infected by HIV. This summer we focused on analyzing the infection rates of cells with and without contact with endothelial cells. We also examined the possible mechanisms by which these endothelial cells allow for higher HIV infection.

We worked with primary cells this summer, which required extracting white blood cells from whole blood that we received from donors. In order to isolate the CD4+ resting T cells, we used a bead separation procedure which involved tagging unwanted cells with metal beads and trapping them in a magnetic column. The collected cells were treated with a variety of conditions including exposure or no exposure to endothelial cells. We further studied two possible communication methods between endothelial cells and CD4+ resting T cells: IL-6, a cytokine, and CD2, a cell surface marker.

At this point, our results suggest that the mechanism for infection may be much more complicated than what we had previously believed. The CD4+ Resting T cells can be further divided into smaller sub categories, naïve and memory cells. These two seem to respond differently to stimulation by IL-6 and endothelial cells. Furthermore, while we feel it is safe to say that IL-6 definitely plays a role in the communication between endothelial cells and T cells, we believe there may be at least one more cytokine playing a role. We are currently investigating what this cytokine may be.

I have truly enjoyed the opportunity to work on this project for the summer. I have learned a great deal from Dr. Shen and have established a great love for research. I have developed new techniques and ways of thinking that will benefit me in my future endeavors. It will be very difficult for me to finish the project and I will definitely pursue research at some point in my future career. I am grateful to Calvin College and Dr. Shen for providing the opportunity for undergraduate students to participate in cutting edge research.