# Roles of endothelial cells on HIV-1 infection and latency in resting CD4+ T cells

My name is Olivia Harlow and I am a student in Dr. Anding Shen's immunology lab along with Meghan Schilitus and Andrew Philipose.

HIV research is becoming focused on finding a way to control the latent reservoir in CD4+ T cells that makes it difficult for the virus to be totally eradicated. Even though the resting T cells that make up this reservoir are few compared to active infected cells, they are significant in their damage. Our lab is attempting to uncover ways that these cells are becoming infected. Among the factors that we have been exploring are the effects of exposure of the T cells to lymphatic endothelial cells (LEC), experimenting the effect of certain blocking antibodies on the infection rates of resting T cells, and looking at other factors that could be involved in the infection of these incredibly important cells.

By using healthy blood donors, we are able to test infection rates *in vitro*. We plate our endothelial cells in 24 well plates, and then after using multiple separation techniques, add our CD4+ T cells on top. For different experiments, we do different separations. If we are testing the infection rates on different days or using blocking antibody, we use resting T cells. However, if we are comparing infection rates between memory and naive cells, we have to separate those resting cells into either memory or naive cells. We then infect our cells with a modified form of HIV-1 and wait 6-8 days for infection to take place before analyzing our data.

Last year, Dr. Shen's team collected data on cytokines overexpressed by endothelial cells and on mRNA comparisons between T cells exposed to different endothelial cells. I spent the first part of the summer carefully looking over these data and finding relevant papers that could indicate to us some factors that seem to be significant. I then started testing these to see which gave us results that we could use. At the beginning, the one that seemed most significant was CXCR3, a receptor prevalent on memory T-helper 1 cells.

Our main approach for the CXCR3 was staining memory and naive plates to see if CXCR3 expression correlated with infection rates and blocking CXCR3 so its ligands could not bind to it. While the initial staining tests seem to indicate that there was some correlation between infection rates and CXCR3 expression, our later tests show that, if there is some difference, it is not significant. Our blocking tests indicated that blocking CXCR3 did not have an effect on the infectability of the cells. At this point, we are starting to test other factors, but will not have a definitive answer on those factors this summer.

This summer taught me just as much about the perseverance and confidence that research takes as it did about the actual science. While there were many setbacks occurring in the laboratory, I was able to learn how to remain patient and optimistic instead of getting frustrated and wanting to quit. By building these character traits, I feel more prepared and excited for future research.