The Effect of IL6 in HIV infection of resting CD4+ t-cells.

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One of the defining characteristics of HIV is its resistance to modern medicine. Patients with HIV must take medications for the rest of their life. The medications are able to kill much of the virus; however, if patients stop taking medication, then the infection can rebound. This is because of a phenomenon known as a latent reservoir. Normally, when a virus infects a cell, it produces multiple copies of itself, lyses the cell, and spreads infection. in a latent reservoir, the virus integrates itself into a cell's genome and remains dormant. Because the virus is not active, the medications are unable to identify and destroy all the infected cells.

My research focuses on the cytokines that influence the infection rates of resting t-cells. The cytokine that we are focusing on is Interleukin 6 (IL6). This molecule is a pro-inflammatory cytokine, and research has shown that its presence increases HIV infection rates in cells.
Brief Narrative: The experiments we conducted involved isolating resting t-cells from donors and culturing human-umbilical cord endothelial cells (ECs) and human lymphatic endothelial cells (LECs). We plated the t-cells over the endothelial cells and introduced virus to the cultures. The plates were then incubated for 6-8 days. Infected cells produce a green fluorescence protein. This allowed infected cells to be identified by the flow machine. The results were analyzed on excel and compared to previous trials.

Based on the data collected this summer and last summer, we know that IL6 is a key cytokine in HIV infection of resting t-cells. When IL6 is blocked, infection rates drop significantly. Another cytokine, CD2, does not affect infection rates on its own, but in the absence of IL6 infection rates are further reduced. Currently, we are using ELISA to analyze IL6 concentrations in different cell cultures. We found that wells that contain older LEC- cells have a significantly higher IL6 concentration. Unfortunately, these concentrations do not correspond with infection rates. This means that there may be other interactions between the cells that we are unaware of. More experimentation is required.

Working with Dr. Shen on this project was a very eye-opening experience. As someone who likes to see results, I needed to learn patience. Each experiment took 8-10 days to set up and run. If there were any errors during the preparation, the results could be seriously affected. Like any activity, conducting research has a learning curve. I was very eager at the beginning of the summer and often made errors because I neglected the protocol or assumed something I shouldn't have. Working with Dr. Shen has taught me to think critically and understand the effect of my actions.