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

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Background: The human immunodeficiency virus (HIV), a retrovirus that attacks immune system, is a major global health problem. According to the World Health Organization (HIV), there are approximately 37 million people living with HIV. HIV also can be transmitted through sexual behaviors and needle or syringe use. Although medicine, such as antiretroviral therapy, has been developed to treat HIV patients, there is no effective cure currently exists.
Previous studies show that the latent reservoir for HIV in resting CD4+ T cells, ensuring viral persistence in immune system, is a major barrier to eradicating HIV. Moreover, two previous studies demonstrated that endothelial cells stimulate and render resting memory CD4+ T cells permissive for productive HIV infection. In this experiment, we examined the effect of cytokine IL6 on HIV infection of resting T cells and compared the effect of lymphatic endothelial cells with human umbilical vascular endothelial cells on HIV infection.

Methods: Voluntary donors' bloods were drawn, and $10 was given to the donors in each time of their donation. Using a biological technique, white blood cells were separated and collected. Then, resting T cells were separated through the biological technique called beads depletion. The collected resting T cells were cultured on endothelial cells and infected with a non-infectious pseudotyped virus. Lastly, the infection rate was analyzed by using a flow cytometer machine.

Results: We found that (1) cytokine IL6 increased T cells infection rate; and (2) the infection rate of memory T cells is more than naïve T cells. It also seems that there are different mechanisms, which endothelial cells communicate with T cells.

Conclusion: Throughout the research program, we learned skills in scientific investigation, such as planning, conducting, analyzing, and evaluating experiments. Moreover, we learned advanced cell- and biochemical- laboratory techniques. Pursuing to go to medical field, I learned not only the scientific investigation skills, but also how to think as a researcher. More importantly, this research opportunity gave me an opportunity to think what it meant to be a Christian scientist and how to restore our world and glorify God as a scientist.