Ibalizumab, The Monoclonal Antibody against HIV-1

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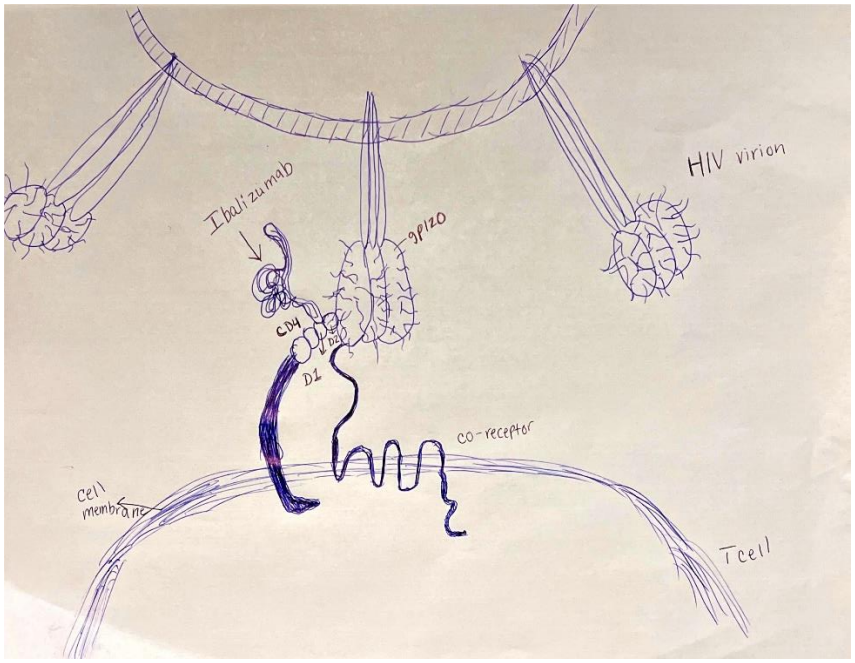
Human immunodeficiency virus commonly known as HIV is a virus that originated in the 1800s from chimpanzees located in Central Africa. It made its way to the United States around 1970 and is still a concern today. HIV attacks the immune system by gradually destroying and minimizing the amount of CD4 T-cells in the body, creating an imbalance in the T-cell homeostasis. CD4 T-cells contributes to the immune response by initiating signals to other immune fighting cells such as lymphocytes and macrophages so they may fight off pathogens. HIV-1 is responsible for destroying CD4 T-cells and weakening the immune system leaving it susceptible to many other illnesses. There are three stages of HIV-1: Stage one is known as the acute HIV infection stage in which there is a large amount of the virus in the blood and is extremely contagious. The second stage is the Chronic HIV infection which can last a decade or more allowing the virus to continue to multiply and lie dormant in the body. If left untreated, HIV-1 can reach its final stage and is associated with the development of acquired immunodeficiency syndrome commonly known as AIDS. AIDS prevents the immune system to properly defend the body against pathogens, ultimately leading to death [1]. At this time, there is no cure for HIV or AIDS.

Due to constant mutation of viruses, approximately 25,000 patients have been diagnosed with multidrug-resistant HIV or MDR HIV. MDR HIV is a form of HIV-1 that has become multidrug-resistant causing patients to become resistant to drugs and medication administered to fight off HIV [2]. Ibalizumab is the first monoclonal antibody that is administered intravenous and binds the CD4 T-cells and the primary receptor for HIV to interfere with its ability to virally enter and attack the host cell. It is classified as an immunoglobulin G4 or IgG antibody that protects the body against viral and bacterial infection. This monoclonal antibody causes changes to the HIV glycoprotein labeled gp120 which is crucial for the virus to survive. Treatments such

as Ibalizumab injections, inhibit the viral entry process preventing the virus to successfully infect other host cells [2]. Ibalizumab goes by the drug name Trogarzo and is injected into the body for approximately 15 to 30 minutes and is administered biweekly. Just as many other drugs, there are side effects of this medication such as nausea, diarrhea, dizziness etc., which is why it is important for the patient to be monitored for an hour after the treatment. Studies have shown that patients in the Ibalizumab trials had an increase of CD4 cell count in their body and a decrease in the viral load. This also results in a decrease in diagnoses of AIDS [2] [3] [4].



[1] Ibalizumab monoclonal antibody mechanism in action binding to a CD4 T-cell

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