

Tony the T-Cell

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My name is Tony. I'm a T Cell. Not a lot of people have heard of T Cells, but we like to think we're pretty important. We're born fighters. We have evolved to protect against the deadliest of enemies - *viruses*. There are many of us, and we are good at different things. I'm a Killer T cell; sometimes people call me a cytotoxic T cell, referring to the cytotoxins I use to subdue virus attacks. The viruses consider those in my Killer T cell class to be the most dangerous. Each of us is specialized against one type of virus, and when they attack, we are summoned to serve by our helper T cells, and we face those viruses in a fierce battle. Everything is on the line. Sometimes viruses are quick, and sometimes they sneak up slowly. Whichever way they attack, they always have a game plan. When we engage them, it's all systems go. We have to be ready.

I'm going to tell you a story about my life, and my greatest adventure when I faced a deadly virus in a battle royal.

I live in a human body, and protect it from the inside. When you catch a virus, they can cause you to have a cold or the flu, they can make you very sick for a very long time, and they can kill you. We are inside you to stop that from happening. We fight them. We protect you.

I started out in the bone marrow, I trained in the thymus, and I underwent tests to make sure I was well suited for my important job. I was tested to make sure that I would recognize an enemy virus and attack it. I was tested to make sure I wasn't a double agent, and I wouldn't attack the body I was supposed to protect. This was the most important test of my adolescence - 98% of T cells don't pass it. After a lot of hard work, I passed this test at the top of my class and matured into what's called a CD8+ T cell, and I awaited the right enemy virus to be activated into the killer T cell I had trained to be.

I waited and waited. I watched other T cells become successful heroes. They would be summoned by helper T cells, and they would achieve the killer T cell status and fight real viruses. I was impatient for my shot. I was ready for the fight.

One day, my human was in a crowd of people. Someone near her coughed, and those tiny viruses, that are way too small to see, traveled. As she took a breath, those tiny viruses were inhaled into her lungs where they started an infection. These viruses were rhinoviruses. You might know them as the common cold, which doesn't seem so bad. What you might not know is that killer T cells like myself are one of the reasons that you humans call them the "common cold" and not "common viruses of death." If we weren't there to fight them, they could kill you.

Finally, It was my turn! It was *me* the helper T cells were calling. I was the only CD8+ T cell in the human's body that could fight these rhinoviruses. I had been trained and tested, and I was ready. There are many kinds of rhinoviruses, but these

were the specific ones I was trained to fight against. I could recognize them anywhere. My mission had started.

When the helper T cells summoned me, my first job was to replicate into an army of myself. Each replicate would be as strong and as capable of fighting this virus as me. My human's tonsils swelled with the overwhelming number of replicates of me. It was my army, preparing for the battle of a lifetime.

Finally, my expansive army started to seek and destroy viruses. Viruses are devious. They hide inside friendly cells to try to blend in. The cells in my army are trained trackers. We pick up messages from the friendly cells to see if their systems have been compromised. If they have, we release our weapons that consist of cytotoxins that force the cell to self-destruct. This keeps the virus from continuing to spread and infect.

This battle was long. For days we were searching and destroying. We lost a lot of good cells that had been infected. The rhinoviruses were quick at spreading and it took some time to seek them all out. Once and for all, I found the last infected cell. When I approached the cell, I checked the code it was emitting. It was corrupted. I looked through my arsenal of cytotoxins. PERFORIN, GRANZYMES, GRANULYSIN. I released all three. The perforin and granulysin sliced holes in the cell membrane so that the granzymes could barge in, initiating a sequence of reactions that caused the final infected cell to self-destruct. For my human, the illness was over. She must have felt ill for a few days, and some viruses were certainly able to escape to infect other humans. At least here, we were able to stop it.

My army was dissolved and I moved back to the tonsils. I was promoted to a memory T cell after this battle since I was able to annihilate the virus from my human's system. Whenever this virus attacks again, I will be able to fight it more strongly and quickly than ever with my new status.

There's also a new, smaller, generation of T cells protecting my human. The bone marrow is still producing more, though not as many, now that my human is older. The thymus is busy training, testing, and selecting the very best to advance. As I move on, all I can hope for is that there will always be T cells ready to fight and destroy the next viral infection.