signals trying to reroute me to another destination, but Gilbert kept me in line and provided me with faith. What he said about having faith was admirable, and from that point on I knew there was something special about that kid.

In Graffiti Magazine, Michelle’s vision in her left eye became cloudy. She tried rubbing her eye, but it didn’t seem to help. She thought maybe it had something to do with the lights on the cameras, but the cells constituting her optic nerve knew that this was not the case. A few hours earlier, we had seen an unannounced increase in immune system cells in our area. At first, we thought it was the blood-brain barrier. And if that wasn’t peculiar enough, they started secreting some weird chemicals and calling in more immune cells. It wasn’t until we saw a massive army of T-cells, B-cells, antigen-presenting cells, macrophages, and microglial cells that we realized these cells actually had to learn how to be a part of the battle. They were warping an all-out chemical warfare on us! Their weapons of choice were a harmful variety of chemicals called cytokines, which got into our eye and started to break it down. A toxic substance called glutamate caused the same harmful symptoms.

When we were monitoring that signals from the retina were becoming abnormal, we realized this was not just a local event, since the breakdown or loss of myelin limits a nerve’s ability to communicate and conduct signals effectively. This must have been when Michelle first began noticing changes in her vision. It was really tough to see my best friend all beat up, but I concluded that they must have been controlled, or maybe possessed, by some entity to start attacking healthy, harmless cells of the same body. This brutal attack lasted another four weeks before tapering off, leaving many wounded oligodendrocytes in its wake. One of these was Gilbert, who suffered a significant blow in the development of myelin breakdown. As glial cells of the central nervous system, we have very limited healing abilities, and more importantly, we’re unable to regenerate. Oligodendrocytes are able to remyelinate some of what is lost, but such heavy warfare left scars of myelin which could not be recovered. It was really tough to see my friend all beat up like that, but after a short period his wounds turned into scars (or more like hard plaque-like build up) and he began to feel better.

Once the attack was over, we did our best to repair and tried to move on with our lives. Michelle had gone to the hospital where doctors told her she had optic neuritis and that she should be aware that this could be a warning flag for some diseases. Yet, when Michelle got her vision back, it left her entirely free and forgot the doctor’s warnings. The next twelve years were happy times for Gilbert and I. I still had full compounds that signal cells are called neurotrophic factors. Oligodendrocyte cells are the last cell type to be generated in the central nervous system, but because the first areas that need myelin are in the brain controlling simple movements and sensory analysis, I was shipped off relatively early. I first met Gilbert in the early stages of our cell migration and differentiation. Apparently, we had both predisposed to going to the ventricular region, where we were formed to migrate on an axon to the optic nerve. And of fate was to aid in the transmission of visual signals from the retina of the eye toward the brain. For the migration, where told to be just brave, was to follow a specific path made by radial glial cells. I was very skeptical about wandering off in the dark. There were a number of times along the way I was nearly overcome by chemical attraction and with more fire power than before Gilbert’s health was getting worse and my optic was so disintegrated in some spots that parts of the axon started becoming visible. It seemed like Gilbert was slowing being converted from a highly functional glial cell to a hard, dead, plaque-like scar. I didn’t know what to do.

Michaela went in and described symptoms of tingling and numbness in her hand, swelling, extreme fatigue, muscle spasms, cloudy vision, and some depression to her doctors. After seeing that her MRI revealed a decrease in T-cell activity, they diagnosed Michaela with Multiple Sclerosis (MS). MS is a neurodegenerative, inflammatory, and possibly autoimmune disease affecting the central nervous system. They said that the mechanisms through which the disease works are known, but the actual cause is still a mystery, and a cure is yet to be found. What we do find that systems usually appear in gradual episodes with periods of remission. Also, depending on the type, relapsing-remitting or secondary progressive, one may or may not experience another remission. Michaela began therapy, which was supposed to ease some of her symptoms, and she started taking a community prescribed drug. The drug is supposed to relieve the stress put on us by mimicking a protein of ours, the myelin basic protein, and acting as a decoy for the immune cells target.

So here I am, a helpless glial cell under attack by my host cell’s own immune system for reasons unknown. My best friend is on the verge of death. I, myself, am experiencing the same symptoms, being used against us. But as Gilbert once told us: ‘One must always have faith. There’s always a chance this will improve our situation somehow and we will survive.’ If the drug can buy us some time, doctors and scientists might discover one of the secrets of this disease and stop it once and for all. No matter how bad things get, as long as the chances are, or how limited the options seem, there is still one choice. Hope. I choose hope.

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Writing

Self-Destructive Behavior

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“Infarnation! Ready yourselves glial brothers, the T-cells are coming!” The message is loud and clear. I now sit in shock and despair, looking back on the happy and peaceful life that I have shared with my fellow cells here in the optic division. I try to feel grateful for the life I have been given. As I sit through it all, I feel blessed to have such a highly specific job as an insulator. I know that the task of guiding messages between neurons is highly regarded and respected, at least among other glial cells. I am also thankful for the close connections between family and friends that this lifestyle affords me. But all the praise in the world will not release me from this growing fear that has clenched hold of me. Since the last attack, I have been plagued by the idea of losing my lifelong friend, co-worker, and fellow glial, Gilbert. Gilbert and I have been running mates since our origin, and to see him in such a degraded and eroded state has drawn a dark cloud of resentment and fear over my being. I really did want to go out with dignity.

“Brace yourselves!” The auto-reactive immune cells have penetrated the blood-brain barrier. They are drawing near! Let me back up a bit and start from the beginning. For starters, I am a cell in a large and vital system of woman who starts in the hit television series “The Secret Life of the Brain.” That’s right! I am one of the billions of other lucky nervous system cells that can Michaela Salahi our home. My story, along with the other glia and the neurons, began during the self-renewal process of normal stem cell division into a progenitor cell. So began my childhood, my egogenesis. This progenitor cell divided until it eventually differentiated into a premotor version of me, a glia. This particular gliaotoblast developed into a young oligodendroglia named Olle. I am not a neuron, but a glial cell. Glial cells are the support cells of the nervous system. We help neurons transmit information by binding them together and providing them with support, nutrition, and protection. As an oligodendroglia of Michaela’s optic nerves, my main function is to insulate part of the axon that carries visual information from the retina of the eye to the primary visual cortex.

For insulation, I use a special coating called myelin that surrounds the axons. It prevents short-circuiting and allows the neurons to send information much faster to another one. My close cousin, the Schwann cell, also myelinate, but they stick to the nerve fibers and neurons outside the brain and spinal cord into the peripheral nervous system. Without the aid of glial cells, neurons would be in rough shape! We outnumber neurons by at least 15:1. Myelination is a great process of reinforcing neural pathways. The entire myelinating process does not come to completion till around ages 25-30. Normal adult function in humans is not attained until myelination is complete, so it can actually be used as a general index to the primary visual system of the brain. The different cells of the body are faced by become specific cell types, with the corresponding forms and functions, from a signal that influences its gene expression. These signals are thought to be chemical messages from the cell’s unique environment and can explain the differentiation of progenitor cells into various neuron and glial cell types. The chemical