

## The Great Plaque

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*The genes of Kent whispered and decided Kent the human needed a new neuron. They sent word to a stem cell who divides and creates a progenitor cell. This progenitor cell hears the whispers and, after a final division, creates you little one, a small neuroblast with no sense of direction. You could have been anyone, but the neurotropic factors decided you needed to be in the primary motor cortex located in the frontal lobe on the right side of the cerebrum. They did not realize how important you would be. The kind and wise radial glial cells guided you to your new home. Once you settled in, you started to mature. Your axon grew and grew; we thought it would never stop growing. You chased these chemicals that finally lead you to your target, the cute motor neuron located in the spinal cord who helped control Kent's left arm. It was love at first sight. It was decided then that you were to be an interneuron, and your connection to the motor neuron decided the other connections you formed. That is how we met you, little one, when your dendrites finally started to reach out to us. This is the story they tell me over and over again, the wise neurons of the thalamus. I am only an interneuron neuron, so I cannot remember my origins, but they can.*

My connections between the parietal lobe, the thalamus and my brothers and sisters of the primary motor cortex are so valuable to me. They speak to me through neurotransmitters, which I receive at the synaptic clefts where I meet my fellow neurons. When I interpret their message, I generate exciting electrical impulses at my axon hillock, which I cannot help but tell my beloved motor neuron all about, and if it is exciting enough, she acts on the excitement transferring the action potential to the tissue she controls.

There used to be so many of us but no more. In the beginning, we had to participate in this game they call neural Darwinism, survival of the fittest neurons. I depended on my motor neuron to take care of me during this time. She fed me the neurotropic factors so many of my brothers and sisters competed for. The genes whispered of others who were not fed enough, and committed cellular suicide. I lost many brothers and sisters this way. This loss was especially saddening because they were the ones who molded me, who released chemicals to let me know how I am supposed to be. I use to have more connections with other neurons as well, but I also lost them because I did not use them. I suppose they were not important to me.

The life of a neuron is a sad one indeed, but there are perks, such as the time I became myelinated. I became able to send messages to my motor neuron so much faster. I gave her as many messages as possible, reveling in my new found efficiency. She liked me because I was so exciting, unlike her other suitor who was always trying to calm her down. I have to compete with him for her to act on my message. If my message is not exciting enough and it does not reach her threshold because the other neuron inhibits her, she does not act and move the tissue she is responsible for. I suppose she needs both of us equally. She cannot always be moving, and she is useless if she is always resting. So goes the life of an interneuron of the primary motor cortex of

Kent's right hemisphere. Life has been good, but we (the neuron world) are getting old along with Kent. This is cause for concern, along with the rumor going around that Kent has not been taking care of himself. The quarter pounders he was always so fond of are catching up to him. He is now overweight, has high cholesterol, and high blood pressure. I heard there have been sightings of fatty deposits called plaques in his blood vessels, but I did not want to believe that time was almost up. Then it came, the gigantic plaque that almost destroyed everything. It blocked our main source of blood, and so we no longer had any way of receiving oxygen. We started dying. I watched as the microglial cells tried to consume the plaque but to no avail. I thought that was the end of everything, but then the plaque started to disintegrate. I learned later that Kent had taken a drug to clear away the plaque. It was a bit too late, though. Most of my brothers and sisters of the primary motor cortex of the right hemisphere were already dead. I watched as the microglial cells took their dead bodies away. I hate them for failing to protect my family, even as they were providing the growth factors that were keeping me alive. The growth factors did not matter because Kent was no longer using his left arm and, consequently, me. It was only a matter of time before I died. I saw the astrocytes coming in, taking the place of my brothers and sisters, sealing off the damaged area. I wanted to scream at them to stop, that they were preventing new neurons from being born, that they were killing me, but I didn't have the strength. The worst part was that I could no longer take care of my motor neuron, and she was dying as well.

I had already signed myself off to die when Kent started to use me again. I started to receive little messages with my few connections, and I tried my hardest to interpret and send the signals to my beloved. The signals were weak, and at first, they were not enough for her to take action. Little by little, they became stronger, and she started to act on my messages. We did repetitive small things at first because I had to do the work of so many of my dead brothers and sisters. It was so tedious. Gone were the days when these messages excited me. Then, we moved on to bigger and better things. I eventually grew large enough and powerful enough to integrate the information that many of my dead brothers and sisters were responsible for. Because of my few living siblings and I, Kent eventually regained the use of his left arm. You see, we told you would be great one day. We knew you were one of the stronger ones. Oh, how proud we are to be able to speak to you. That is what the neurons I am connected to in the thalamus tell me. I do not really think of myself as great. I am more of one of the luckier neurons. Kent is lucky, too. I think this was a wakeup call for him. He has been taking care of himself now. He no longer eats quarter pounders and has lost a lot of weight. It seems very likely that we might be blessed with a good fifteen more years.

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