A Mindful Vixen: Degradation Due to Methamphetamine

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Life was good. I was the most popular neuron of the mesocorticolimbic-dopamine system in the small town of Ventral Tegmentum, Midbrain USA; home of the famous reward circuit of Stewart Evans. Stewart Evans exists because dopamine, known as the “pleasure neurotransmitter,” is present in my synapses and when I communicate with my connections, I release dopamine with an action potential, where dopamine goes from the presynaptic terminal, released from its vesicle by exocytosis, and into the synaptic cleft and binds to one of my friends, let’s say Arvid, receptors. Arvid gets very elated and will transmit my chemical message to his own to send out while my re-uptake mechanism, VMAT2, sends dopamine back to me to recycle or removes it entirely. I always loved this, it’s always satisfying for me to communicate with my friends, that is, until one day something strange happened that I still do not understand nor do I know if I like.

It was a Tuesday when the foreign invader came rolling through my little town. She was the most deceptive creature a neuron could ever meet; she looked like dopamine, felt like dopamine, spoke like dopamine, however, she was everything but what I expected. When she came my way, I did not sense her arrival, nor do I know when it happened, but I knew I was not normal anymore. Every time Meth came in, my connections and I enjoyed our ways of communication. When Meth decided to leave our town, she took all of her fun with her and I crashed harder than anything I had ever experienced. Meth’s way of activating my dopamine signals were a thousand times greater than when Stewart had sex, and the crash was intense. I could not sense more than a few neurotransmitter particles and I felt like I had lost some of my dendritic spines from Meth’s encounter.

Normal levels of dopamine were no longer satisfactory for me. I could not send out signals to Arvid or Barger or Ewens like I did before. I sensed that my cell body was the same as it always was, but my dendrites were no longer functioning the right way. I was surviving the roller coaster of Meth coming and going, but Ewens could not. He was so torn apart that I could not send or receive dopamine from him anymore. I began to stop sensing him entirely after Meth left the fifth or sixth time. It was difficult to get adjusted to, having Meth flood me with dopamine and then feel nothing, but she always came back and eventually I would feel something again.

This went on for what felt like years and I aged rapidly from these chemical changes. My dendritic spines were brittle and small that I virtually stopped all communication with Barger and Arvid. I grew depressed from a lack of social interaction and that my dendrites were virtually gone. My receptors did not want to accept any neurotransmitters and I knew I was not normal anymore. Every time Meth came through town, I aged more rapidly while she looked better than ever. I could not handle it anymore and I think Stewart felt the same way because Meth stopped coming to see me. I hoped I would recover and sense my connections again. I knew I could not regenerate but I could not get any worse. Right?

Wrong. Stewart quit cold turkey, the wrong decision, and a life threatening decision. I continued to degrade without Meth coming and going. I continued to die faster and faster and I watched my town die along with me. There was darkness in the horizon; a bulging blood vessel crept up in Ventral Tegmentum. It seemed to bulge more, very quickly, after Stewart quit Meth. I do not know when it happened, but now in my life, I sense that bulging vessel is going to burst. My life seems wasted and I am not feeling right. I decided to think it all over while I sit here trapped in my cell body with no way to communicate. I feel like the entire brain knows something is wrong and is trying to give Stewart a warning, but I am not sure. I cannot feel much anymore. Everything is flooded, not with dopamine, but with lifeless waste.

I am flooded and fading away. Something happened, maybe that vessel ruptured. I can sort of sense microglia in the area, but I cannot signal to them that I am here. I know I am a problem in this brain and do not deserve the choice to recover. I see the clean up crew of microglia picking up the devastated town I live in, the town I shredded because of a woman named Meth. Its growing dark, I feel a presence all around me. Microglia? Are they coming to eliminate me? I need to be eliminated, as I have no use for the brain anymore. I hope it doesn’t hurt.

List of Neurological Concepts:  
Midbrain, neural tube formation, cell types, neuronal development, structure of synapse, stages to neurotransmitter function, action potential, types of...
neurotransmitters, structure of a neuron, brain parts, altered structure of neuron, drug use affects on neuron

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References


