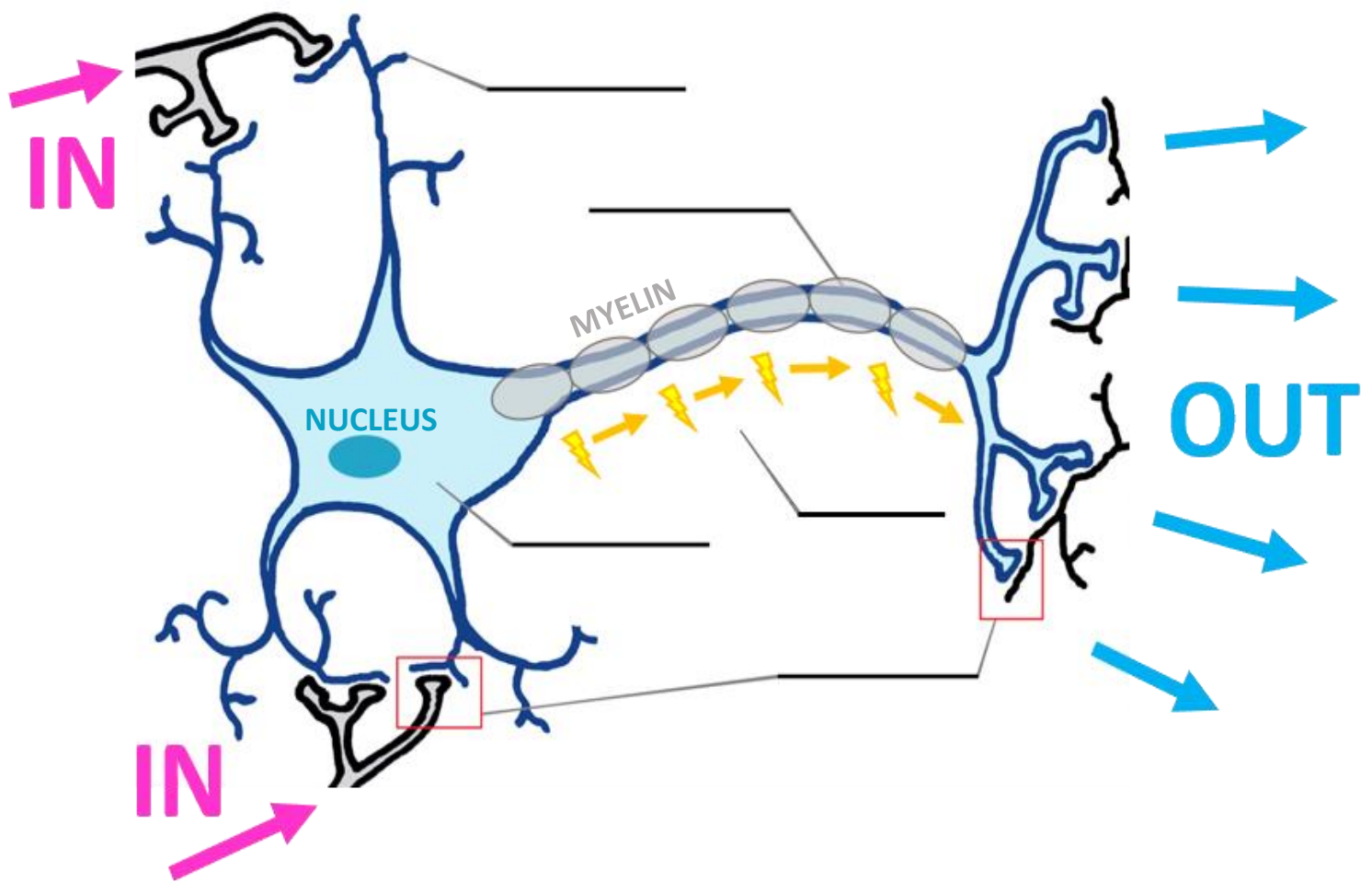


Lesson 6- Read the following, and fill the blanks on the image with the correct capitalized words from the text

Neurons – Computers of the brain

Neurons are the smallest units of the brain capable of performing computations. These are cells that come in various shapes and sizes. However, a few features are common to many of them. Neurons have a SOMA, or cell body, where the nucleus is contained. Attached to the soma are DENDRITES, where information comes in from other neurons. Neurons communicate with each other through thousands of SYNAPSES. At synapses, two partner cells communicate with each other through signaling molecules called neurotransmitters. One neuron (the pre-synaptic cell) will release neurotransmitter out, which crosses the synapse and binds to receptors on the second neuron (the postsynaptic cell). This binding sends information out to the next cell.



Neurons are like tiny computers, constantly collecting information through their dendrites. This information is measured in the SOMA, and might cause the neuron to experience an “action potential” (AP). An AP is an electrical impulse that is generated in the soma in response to information coming in from the dendrites. APs propagate down the AXON, which is covered in myelin to help the AP transmit reliably. APs cause neurotransmitter to be released onto the next cell at the synapse. Individual neurons may be tuned to pick out features of a stimulus: for example, the direction of movement in a visual experience, the pitch of a sound, or the intensity of a touch. They will generate APs when the body has a certain experience, and those APs give the brain information about what is happening in the world.

Neurons and multitasking

The brain contains 86 billion neurons, and each neuron is thought to be stronger than the world's most powerful supercomputer. Then why is it that multitasking is so difficult for the brain? It turns out that tasks your brain does are just really, really, complicated. Not only can you see with a resolution higher than many of the fanciest computer screens, but you can make really complicated predictions about what the objects in your field of view are about to do. When you are driving, billions of neurons are dedicated to the task. Neurons help you identify the cars in your field of view, and other neurons predict whether they are going to stray into your lane and cause you to swerve. When you do swerve, a whole different set of neurons plans how you are going to turn the wheel, and motor neurons send signals to your hands to make you perform the action. Other neurons send feedback to your brain about how hard you are turning the steering wheel, and whether you should turn it harder to avoid a collision.

Careers in Neuroscience

The complexity of the brain means that we could study it for years and years and never fully understand how it works. Every little bit that we do learn can have a big impact on human health, helping us treat diseases from Alzheimer's to Parkinson's to epilepsy and depression. Watch the videos provided by your teacher to learn more about how the brain multitasks, and how scientists go about studying brain function.