A Look Into The Sympathic Nerves

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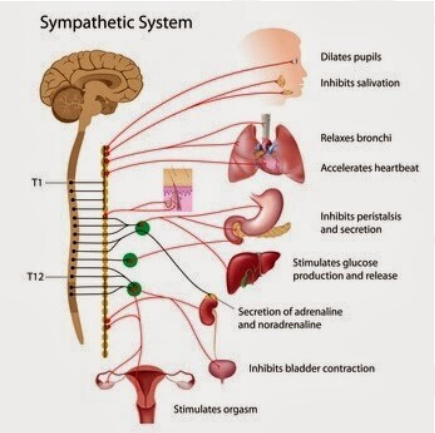
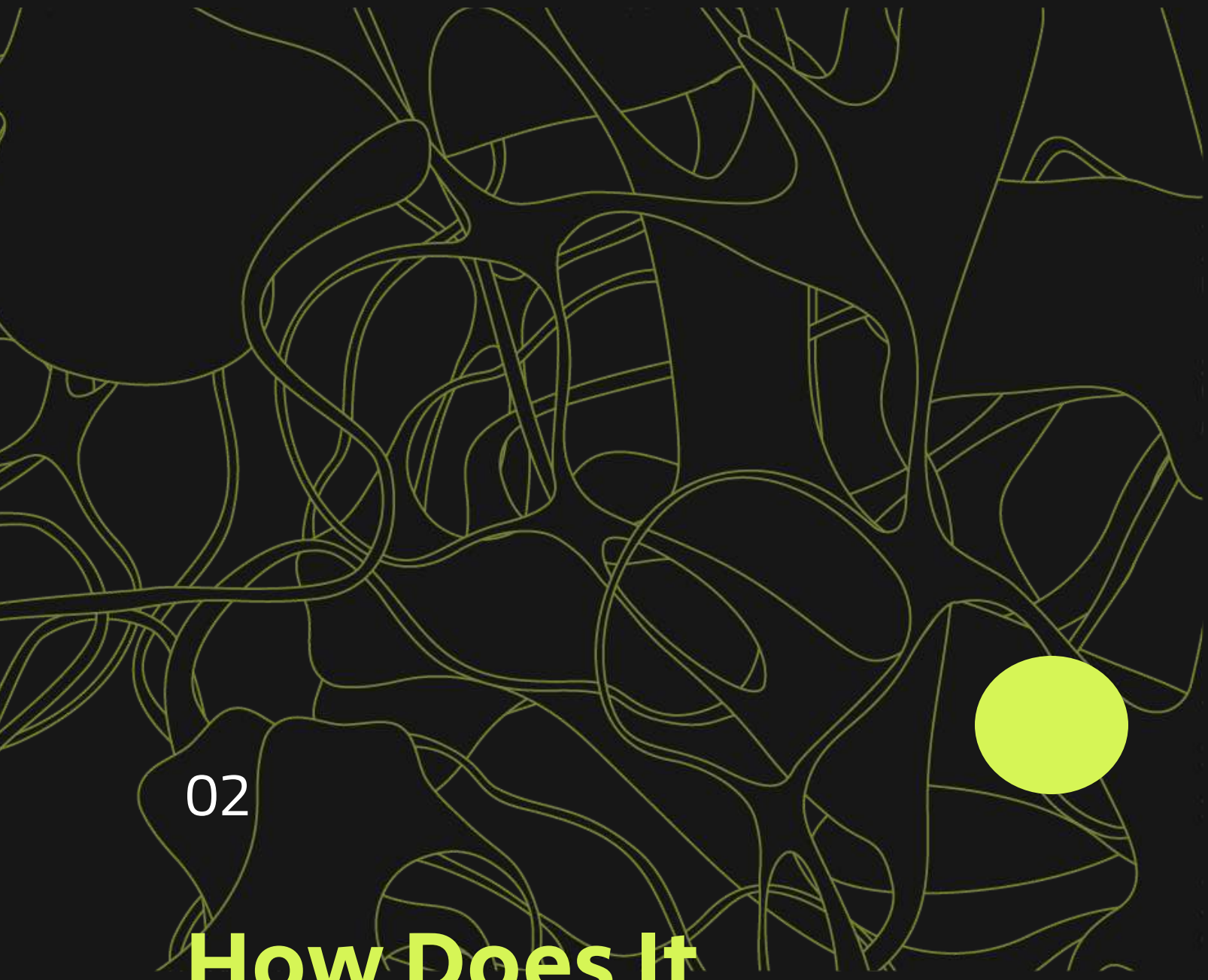
The Sympathetic Nervous System

The body relies on the gut system to help regulate its homeostasis and metabolize the nutrients for the immune system. The beneficial gut bacteria help maintain the intestinal walls from developing chronic issues and affecting the entire body. The gut system also provides information to the central nervous system through the spinal cord to the brain. The neuron signals help transport the information to all the corresponding muscles, tissues, and organs that require the gut system to stay healthy and functional. When the gut develops issues, the related muscles, tissues, nerves, and surrounding organs begin to feel the effects, causing the body to be dysfunctional. When this happens, many individuals will start to suffer pain and go to their physicians to find relief.

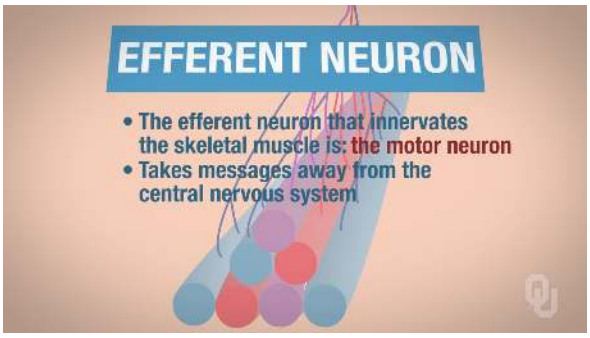


Have you been feeling stressed throughout the entire day? Do symptoms of inflammation tend to flare around the abdominal area or the abdominal organs? Do your muscles seem to tense up more than they should, even in their relaxed state? All of these signs and symptoms that affect the abdominal region of the body are all connected to the sympathetic nervous system in the body. Research studies have defined the sympathetic nervous system as part of the autonomic nervous system, a central nervous system component. The best way to describe the sympathetic nervous system is that it activates the adrenal glands to produce the hormone adrenaline causing the body to be in a "fight or flight" mode. The sympathetic nerves also help regulate the alpha and beta receptor activity of the various corresponding organs that stimulate the blood vessels surrounding the body, causing a relationship of the organs to the muscles.



02

How Does It Affect The Body?



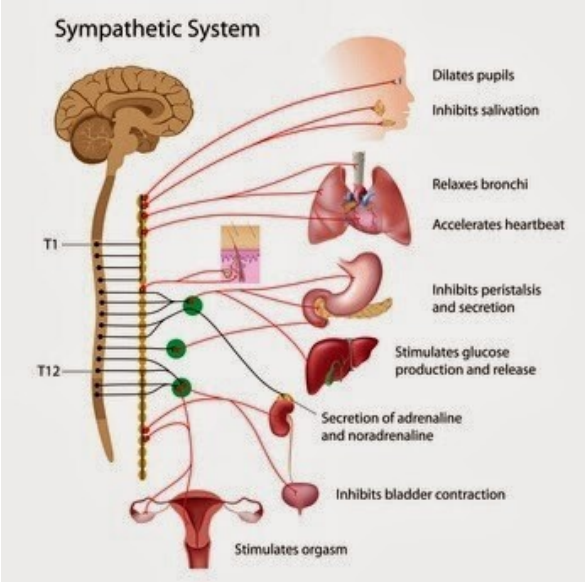
As part of the autonomic system, the sympathetic nervous and parasympathetic systems help the body achieve homeostasis by exerting influences over the organ systems. Research studies have shown that this causes the organ systems to upregulate and downregulate the various functions that each muscle needs.

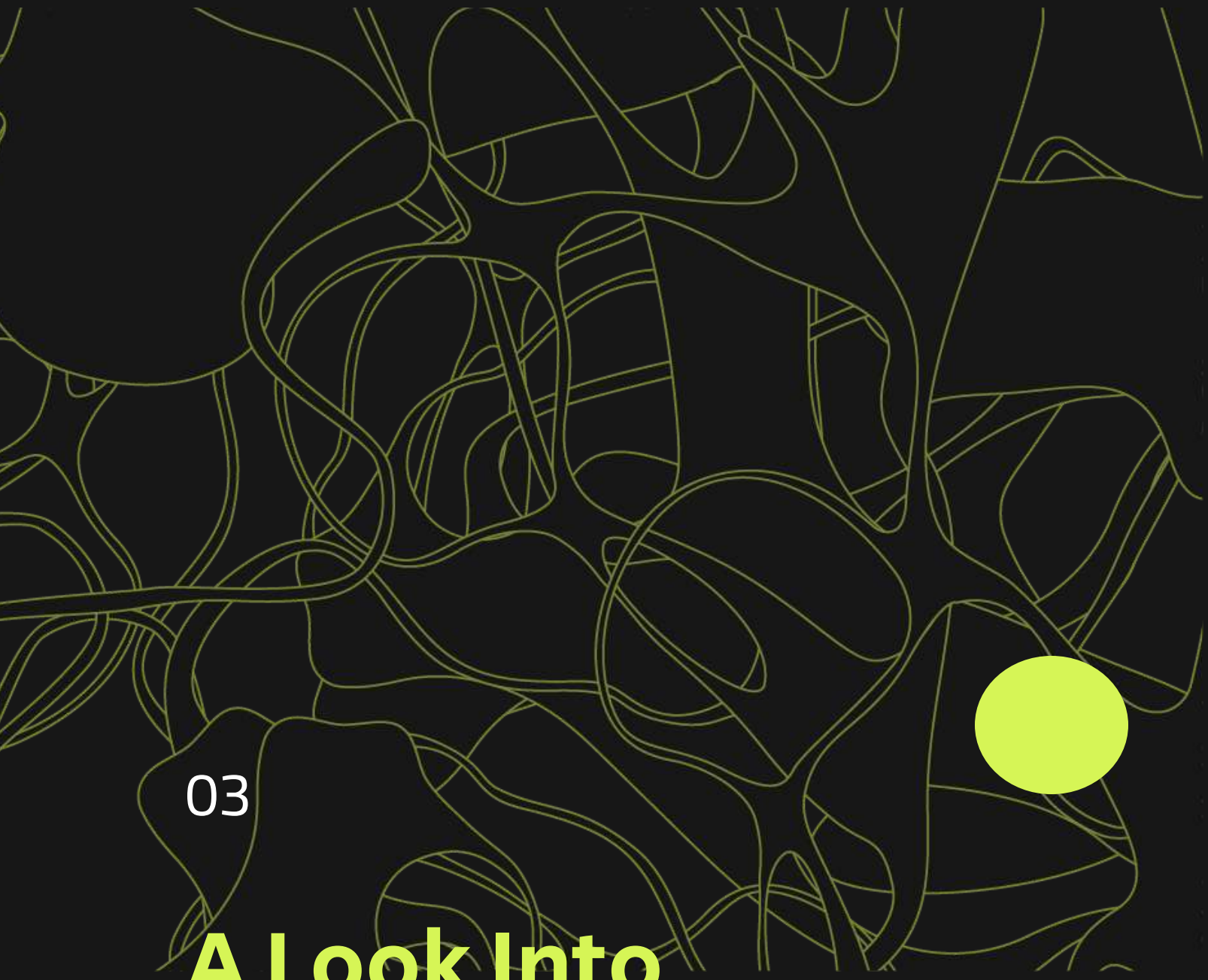
Some of the tasks that the sympathetic nervous system that activates these organs include:

-An increased metabolism
-Decreased GI motility
-An increased heart rate
-An increase in movement and strength -
Suppression in the immune system -
Constriction of the large arteries and veins
-Increase glucose production

Additional studies have noticed that the neurons in the sympathetic nervous system help prepare the body for various physical activities that affect the organs.

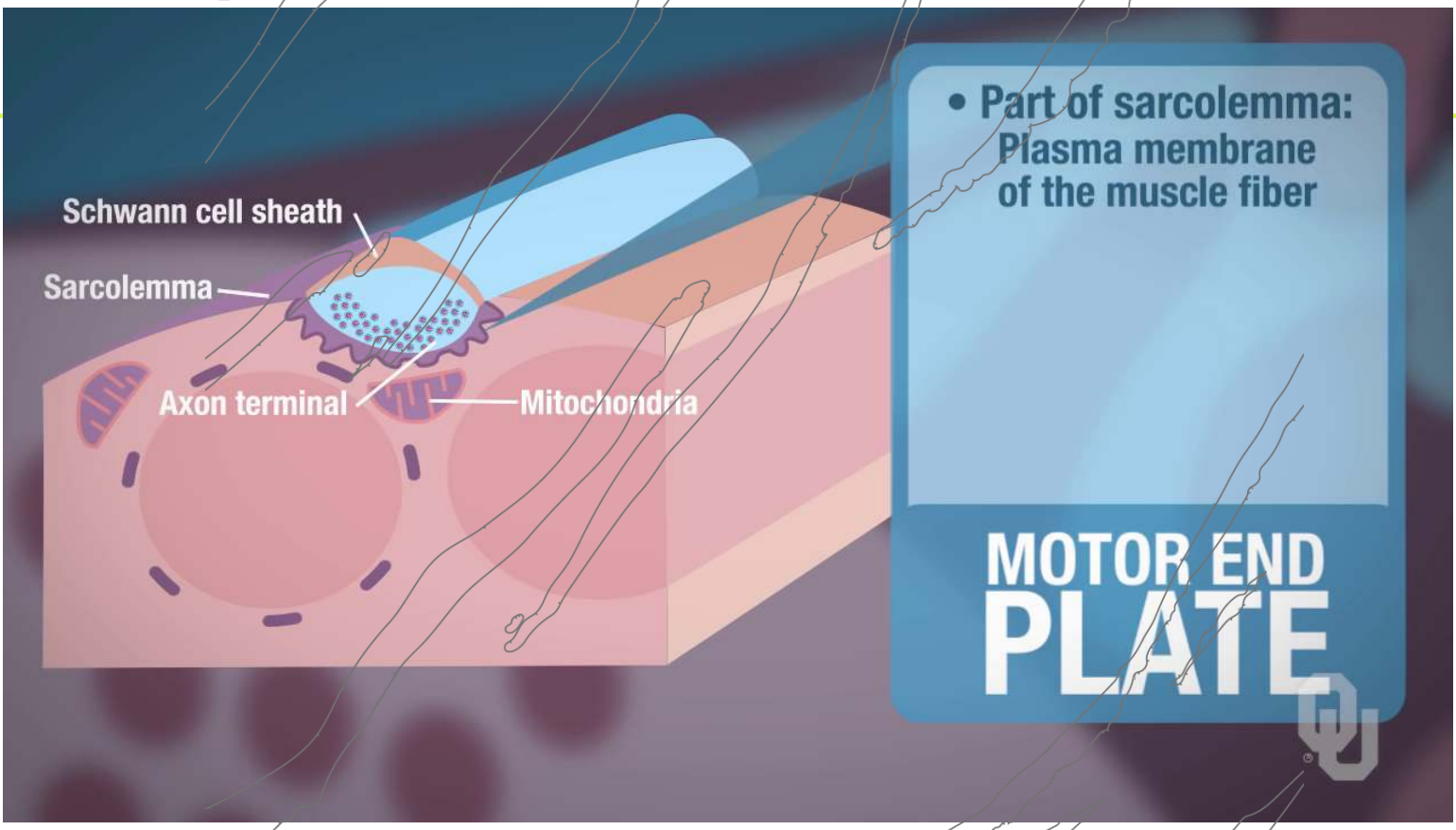
Have you experienced knee pain while having issues in the pelvic region? How about feeling pain in the lower abdomen that triggers spinal stiffness in the lumbar parts of the back? Or have you noticed any pain from the testicular area is relieved after a spinal manipulation? These symptoms are mediators of the sympathetic nervous system when internal organs are damaged. The video above explains the sympathetic nervous system and how it functions in the body. When the body suffers from traumatic forces or ordinary factors, it can cause an increased risk of other associated problems that can also affect it. The afferent fibers from the sympathetic nervous system can carry the pain signals from the somatic and visceral tissues that converge at the common synaptic site that is within the spinal cord. Research has stated that the somatic nociceptive signals can disrupt the gastrointestinal tract due to stress from various locations in the gut system. When this happens, it can cause an overlap of risk profiles in the entire body.



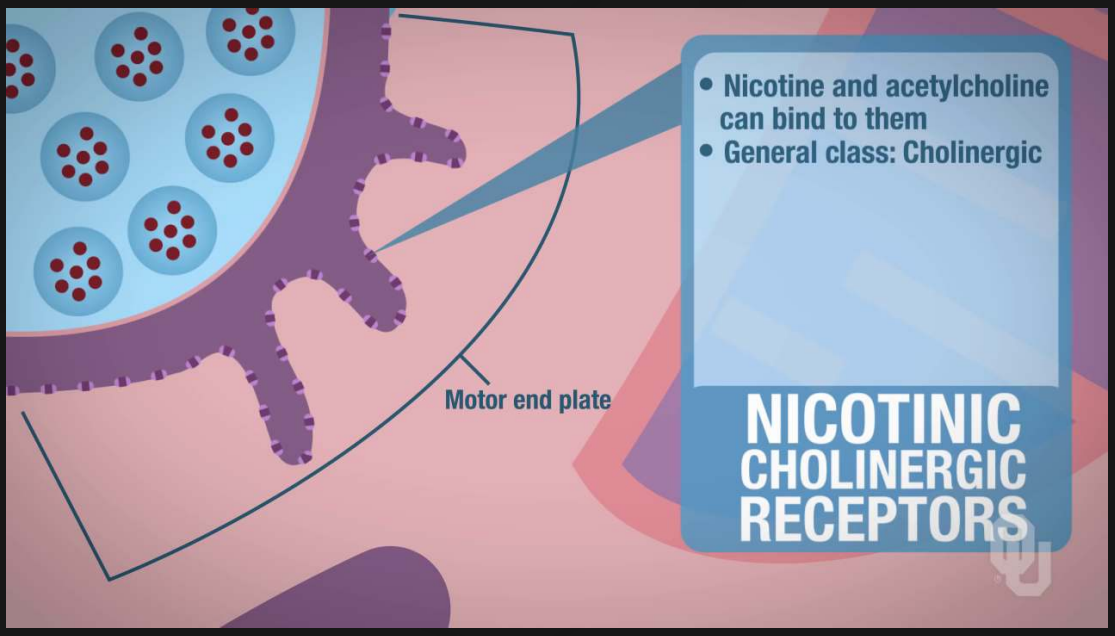


03

A Look Into The Sympathic Nerves

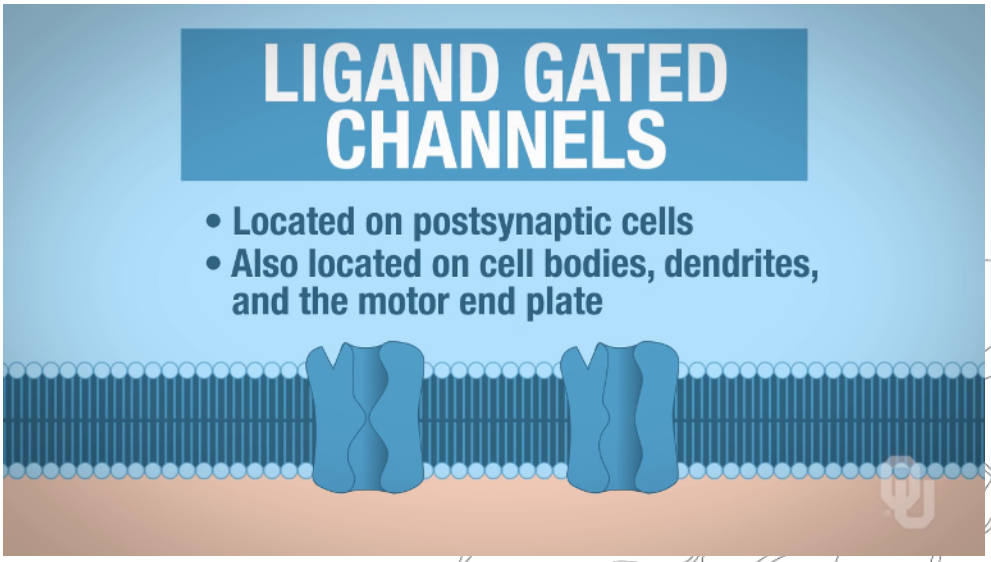


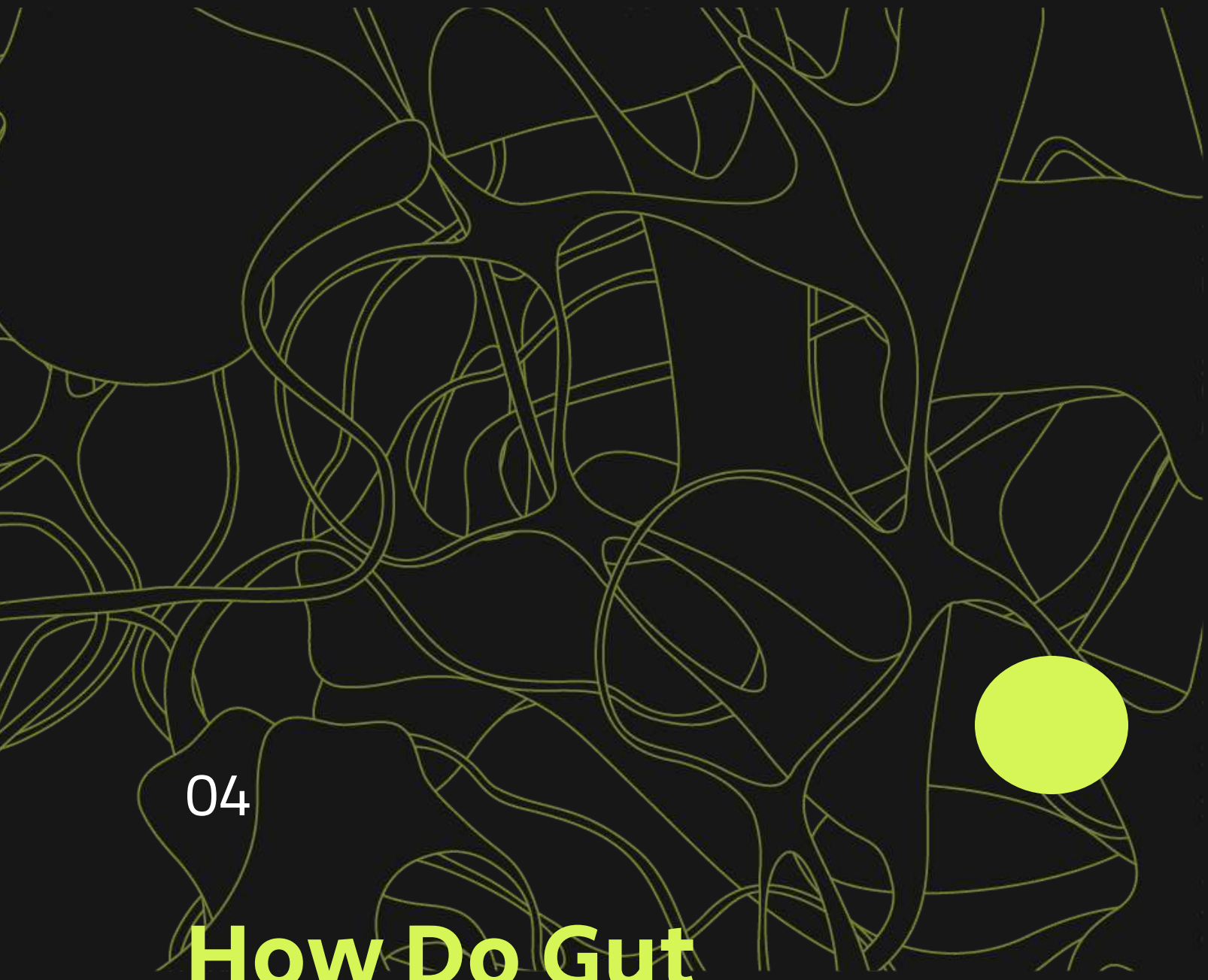
Let's focus on the somatic nervous system. We will focus on the efferent division of the peripheral nervous system, specifically the somatic nervous system. People must understand what it means when doctors say a nerve innervates during an examination. So when they say we have a nerve that innovates the eye, for example, that means the nerve is connected to a certain region in the eye, and the eye sends signals via this nerve to the brain. So innervate means a nerve connects an organ, and signals are sent from or delivered to that organ via a nerve. So in this example, if we take the sympathetic nerve that innervates the eye when that sympathetic nerve is stimulated, it will cause the pupils to dilate. So when somatic is mentioned, we want to know what effector we are talking about, which is the skeletal muscle. So the somatic nervous system controls one type of effector: skeletal muscle. And we ask ourselves whether the skeletal muscle is voluntary or involuntary, which is voluntary. Since we are discussing skeletal muscle and the somatic nervous system, the specific name given to the efferent neuron that innervates the skeletal muscle is the motor neuron.



So when you look at the diagram where it says motor neuron, that is a type of efferent neuron. Now the efferent neuron takes messages away from the central nervous system. A few other items people need to be familiar with to understand this module include the following: a muscle fiber, the same thing as a muscle cell. Muscle cells are cylindrical. So when you see that term, muscle fiber, do not let that confuse you. It's just a cell. And because it's a cell, it has organelles. Next is the motor unit. When you hear the term motor unit, you need to think of a motor neuron and all the muscle fibers it innervates. So with that being said, each muscle fiber is innovated by only one motor neuron. So when you look at a diagram, every one of those muscle fibers is only innervated by one neuron. So here we have a neuromuscular junction. A neuromuscular junction is between two structures, a motor neuron and a muscle fiber, and these are at the end of the motor neuron, so they must be axon terminals, but you have different names.

When you start getting into muscle and neuromuscular junctions, you can still call in an axon terminal; that's fine, but realize that it's also called a terminal bouton or a terminal button. So different names but the same structure and same function. All right, so inside the axon terminal is the neurotransmitter or acetylcholine. And this is at the bottom and is called the motor end plate. It's part of the sarcolemma, the plasma membrane of the muscle fiber. So the motor end plate is only that region that sits right below the terminal button, and the motor plate is just part of your plasma membrane, which will be called the sarcolemma of skeletal muscle again. There are two types of receptors, nicotinic and muscarinic cholinergic receptors. On the motor end plate, we have these nicotinic cholinergic receptors. These are called nicotinic because nicotine and acetylcholine bind to them. The general receptor class here is called a cholinergic receptor, and since ligands bond to them, they're called Ligand-gated channels. Ligand-gated channels are located on post-synaptic cells. When acetylcholine binds to the nicotinic cholinergic receptors, it will generate a fast response that requires a G protein.



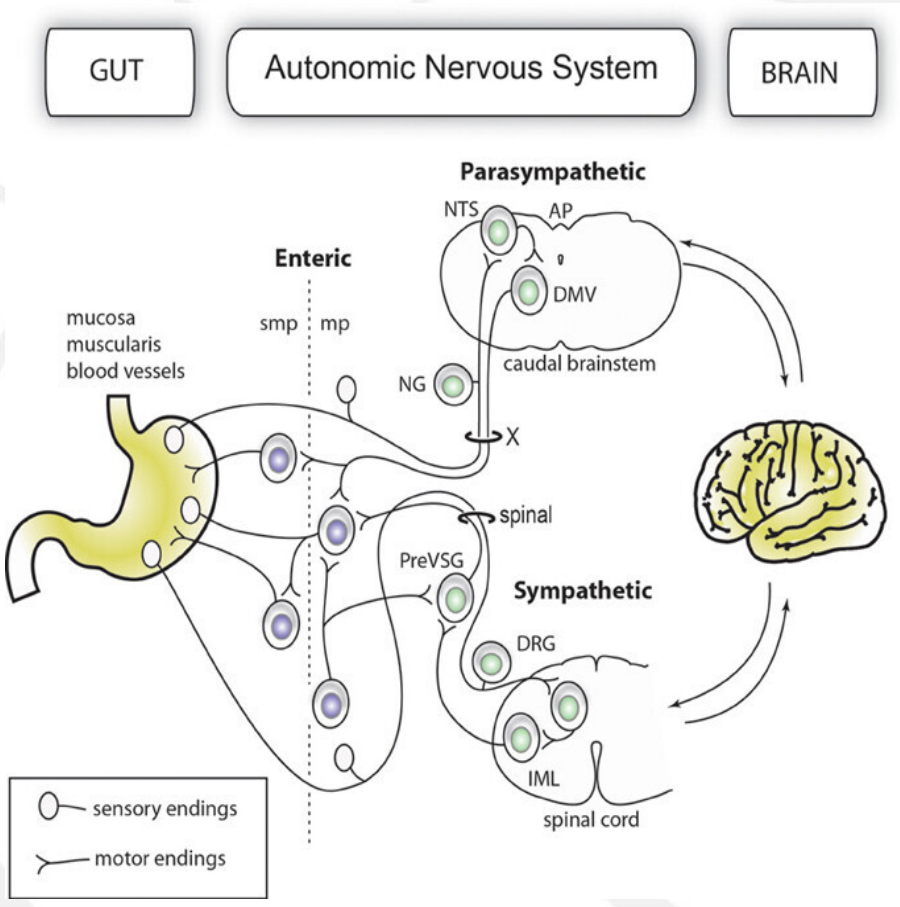


04

How Do Gut Disorders Affect The Sympathetic Nerves?

The way the gut system works is that it provides homeostasis to the body by regulating the immune system. When the sympathetic nerves are intertwined with the gut system and the spinal cord, research studies show that the sympathetic innervation to the GI tract helps regulate the motility, secretion, and blood flow by correlating to the nervous system's activity and modulating GI inflammation. When the guts system begins to suffer from disorders affecting the entire body, it can trigger alarm points to the meridians that closely associate with one or more internal organs in the gut system. These alarm points are coincidentally represented as the first instances of visceral pain or tenderness to the somatic structures. When this happens, many physicians will notice that visceral pain involvement overlaps with referred pain, correlating with the individual's history and other signs of dysfunction. This is a technique called nerve tracing, where physicians follow the line of tenderness from a painful region of the body to the spine, like how GI issues can cause musculoskeletal pain and disturb the visceral tone.

The body requires the gut to maintain homeostasis and help regulate the immune system. The gut system also provides information to the central nervous system by letting the neuron signals transport the sensory-motor functions through the sympathetic nervous system to make the body functional. The sympathetic nerves help provide organ activation to the body that can help prepare the body for various activities. When the sympathetic nerves become irritated, it can cause the muscles and organs to be triggered and change their functionality. This can make the surrounding organs and muscles have an increased risk associated with other disorders that affect the body and correlate to different symptoms. When individuals inform their primary physicians about these symptoms, it gives them a better understanding of these disorders' causation.



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