Research Assessment #17

Date: February 3rd, 2021

Subject: Nerve Growth Factor: Early Studies and Recent Clinical Trials

Assessment: "Nerve Growth Factor: Early Studies and Recent Clinical Trials - PubMed." *PubMed*, Current Neuropharmacology, 2018, pubmed.ncbi.nlm.nih.gov/29651949/. Accessed 5 Feb. 2021.

Nerve growth factors (NGF) are one of the most important components of nerve guide conduits. This growth factor is naturally produced within the central nervous system and is generally used to regulate certain functions. In the pituitary gland, NGF helps control the secretion of hormones to different parts of the brain. Within the review, "Nerve Growth Factor: Early Studies and Recent Clinical Trials", the effects of NGF and the results of clinical trials are discussed thoroughly.

According to the article, these growth factors can be implanted directly on the brain lesion, by injecting it into the neurons and transporting it via the synapses. To continue, these factors can be used to treat various types of disorders and wounds, such as Alzheimer's, peripheral nerve injuries, and brain traumas. Moreover, through clinical trials, nerve growth factors were discovered to be an efficient form of therapeutic medicine because they increase the formation of granulation tissue, the production of collagen, and the acceleration of fibroblast migrations. Over time the growth factors can also significantly reduce inflammation and pain at the site of injury. To summarize, the review claimed that nerve growth factors are a form of therapeutic microbials that can increase the rate of recovery for individuals.

Furthermore, regarding my final product, these nerve growth factors are an essential part of the nerve conduits, and the information I learned from

the review helped me connect nerve growth factors to their roles in nerve guide conduits. Since the nerve growth factors increase the fibroblast migration into the conduits, the shape of the conduit must have superior mechanical properties that are adaptable to the migration of other parts such as fibroblasts and be able to handle the flow of fluids throughout the body. These fibroblasts are vital for the creation of the extracellular matrix and which will create a layer around the injury site and protect the lesion from more damage. In addition, since the nerve growth factors also increase the production of collagen, the nerve conduit will be
more efficient if it is made up of collagen as well. If the conduit itself has collagen, then it will be more likely biocompatible with the extra collagen being produced by the growth factors. Besides, the more natural polymers that are within the conduit, the more biodegradable the conduit will be.

Even though the article mentioned that these nerve growth factors can be directly injected into the lesion, it might be riskier to conduct this procedure for the bundled nerves in the spinal cord. Injecting them into a solid object, like a hydrogel, can help physicians have greater control over where the growth factors are used up. Moving forward, I will be discussing the facts I learned about the therapeutic microbials and will learn more about how these microbes are synthesized within labs. Some of the questions I have after reading this assessment are about the ability of factors to sustain in porous conduits, and how long they last within a conduit before being used up. Answering these questions will help me predict the necessary shape for my conduit and the amount of nerve growth factors that need to be injected, to last the nerves for 2-3 months of recovery.

Annotated Article: https://kami.app/1sdiVlfj424y