

Research Assessment #1

Date: August 3rd, 2020

Subject: Application of fibrin-based hydrogels for nerve protection and regeneration after spinal cord injury

MLA citation(s):

Yu, Ziyuan, et al. "Application of fibrin-based hydrogels for nerve protection and regeneration after spinal cord injury." *Journal of Biological Engineering*, vol. 14, no. 1, 2020, p. NA. *Gale Academic OneFile*, <https://link.gale.com/apps/doc/A631917264/AONE?u=j043905002&sid=AONE&xid=2d5470a4>. Accessed 31 Aug. 2020.

Assessment:

To begin, SCI is a serious impairment to the human body as the spinal cord is not only part of the backbone of our body but also plays a very important role in our nervous system. Furthermore, this topic was of interest as I have had a close relative affected by a spinal injury and although the injury wasn't directly to the spinal cord itself, I have been able to see how these types of injuries can affect people and those around them. To continue, the article, "Application of fibrin-based hydrogels for nerve protection and regeneration after spinal cord injury", provides an in-depth view of the health consequences for people with spinal cord injuries and how that can impact their day to day lives and also the disadvantages and advantages of fibrin hydrogels as a treatment as there are still many unknown qualities of how fibrin may react in different situations.

The human nervous system is broken up into the Central Nervous System and the Peripheral nervous system; the spinal cord is a part of the CNS like the brain but in addition, it also has spinal nerves attached to it which are part of the PNS. To continue, an injury to the spinal cord itself, could cause a large amount of traumatic pain but it also includes but not limited to cell death, limb paralysis, issues with the reproductive system, etc. In addition to the traumatic aftermaths, another important concern is to prevent further damage and death of remaining nerves which is an expensive endeavor and it can also take great toll on the patient's family and even their mental health. However, fibrin based hydrogels are turning to be the next new thing which could solve many of the problems mentioned above.

Furthermore, the article mentions that fibrin hydrogels can be made using a fibrinogen solution and a thrombin solution, and these hydrogels can be used to carry other cells to the spinal cord in order to

repair damage. For example, one specific example from the article mentions how human oral mucosal stem cells could be implanted within fibrin cells which can then be injected into the body. After the fibrin hydrogels are inside the body, they start to eject different substances which can increase myelin (protection for nerves and facilitate travel of messages within a neuron) production and it can also reduce the number of glial cells (if glial cells are too high it can cause a physical inhibition for myelin growth and axon regeneration).

On the other hand, even though fibrin-based hydrogels seem to be a miracle drug there are still many challenges to face before it can be completely accepted for clinical and commercial usage. These factors include ethical, governmental, clinician beliefs, etc. In addition the process of treating a patient using fibrin is no easy task, even though the hydrogels can help decrease blood-borne diseases it can also cause an inflammatory response to the patient, and for someone who already is suffering with a SCI, this consequence could be very painful and traumatic. Further research is still being conducted on how to facilitate the treatment of fibrin to the patient. After reading this article, I plan to continue my research upon fibrin based technology but how it is specifically used to treat the patient and expand my knowledge on other ways in which SCI could be treated through different techniques.

Annotations can be found [here](#).