Clinicians today identify standardized, baseline measures of spinal cord injury (SCI) severity by asking patients if they can feel sensation or move key muscles. By identifying the injury severity, treatment options can then be explored for acute SCI patients. However, clinical trials investigating these treatment options have not yet yielded convincing results, in part because of the challenges in recruiting and diagnosing research participants. Identifying biological markers that can act as an indicator of SCI severity in both the blood and cerebral spinal fluid (CSF) of patients would allow for a non-invasive aid in current assessment practices and work towards clinical validation of novel therapies for acute SCI.

MicroRNA are small noncoding RNA molecules that function in the cell to control gene expression/protein production. The current body of literature suggest that MicroRNA orchestrate a wide range of biological processes such as inflammation, memory formation and cell death. In our previous study using a large animal pig model for SCI, MicroRNA showed strong differences in both type and quantity for SCI severity, in the serum of the injured animal. In this project, we looked towards replicating the study with human SCI patients using their CSF and serum samples. Using Next Generation Sequencing (NGS) technology to identify and quantitate MicroRNA levels, we found strong differences in their levels for different SCI severities. The analysis was done in parallel to our pig model because the characterization is important to establish if the biomarkers found in the pigs can be transferred to humans.

Themes:

Check (highlight) the most applicable theme according to the abstract.

| Innovation and Technology | Health and Wellness | Culture and Society | Sustainability and Conservation |

Comments:

Please describe the conclusion further if possible and ongoing questions related to your hypothesis.