

**Dr. Brian Kwon**

***Bench to Bedside and Back: Translational Research in Acute Spinal Cord Injury***

Translational research invokes the bidirectional flow of investigation and knowledge generation from both bench to bedside and bedside back to bench. We began by initiating a clinical trial in acute spinal cord injured patients in which cerebrospinal fluid (CSF) pressures were monitored and CSF samples were analyzed biochemically for biomarker discovery. This provided novel insights into the potential spinal cord perfusion pressure changes that may be occurring in the early post-injury period, and also established a series of neural proteins that could potentially classify and predict injury severity and outcome. Ongoing work in this has led to the expansion of our clinical trial of CSF pressure monitoring and CSF sampling to other sites across Canada. Taking these insights “from bedside back to bench”, we established a large animal model in which we could evaluate changes in CSF pressure around the injured spinal cord. This animal model also enabled parallel investigations of CSF samples for biomarker discovery. Such animal models were also utilized to evaluate novel therapies, and we led the development of a neuroprotective agent that recently entered into clinical trials in acute SCI patients, thus completing the “bench to bedside” loop. Along the way, we have worked to establish consensus amongst the scientific, clinical, and patient communities about what is required to justify translation of novel therapeutics in acute SCI.