Introduction: This study was designed to assess the pathologic and metabolic changes that occur after injury and IL-10 stimulation to a rat tail whole organ IVD during long term culture. It was hypothesized that there will be a significant decrease in the production of inflammatory and degradative biomarkers in response to stimulation with IL-10 in injured and uninjured IVDs. Further, the production of inflammatory and degradative biomarkers in response to IL-10 stimulation will be significantly higher in injured IVDs compared to uninjured IVDs.

Methods: Tails were collected from 6 skeletally mature Sprague Dawley rats euthanatized for reasons unrelated to this study. IVD Explants (n=24) were created and assigned to either the Injured or Uninjured group with or without IL-10 at 10.0 or 0.0ng/ml. Explants were cultured for 12 days, and media were changed every 3 days and collected for biomarker analysis. On day 12 tissues were processed for cell viability using a resazurin assay.

Results: On day 3 of culture, groups treated with IL-10 produced significantly lower levels of media GAG, PGE2, and MMP Activity. Injured IVDs treated with IL-10 produced significantly higher levels of GROKC, and uninjured samples treated with IL-10 produced significantly lower levels of VEGF.

Discussion: This study uses a whole organ model of disc disease to uncover pathways activated by IL-10 stimulation with and without injury to provide potential diagnostic biomarkers and therapeutic targets for IVD degeneration. The results suggest that IL-10 shows protective and antidegradative effects, and in uninjured samples IL-10 may decrease vascularization.