Diffusion Tensor Imaging in Rat Spinal Cord In-Vivo ZEINAB AL-REKABI, University of British Columbia — Diffusion Tensor Imaging (DTI), an MRI technique based on probing the structure of tissues at a microscopic level is used to determine regional values of Fractional Anisotropy (FA) and mean diffusivity ($D_{av}$) of excised and in-vivo rat spinal cords. Two pulse sequences: Spin Echo (SE) and Echo Planar Imaging (EPI) are optimized to provide the best image quality, signal-to-noise ratio (SNR) and the greatest spatial resolution at reasonable acquisition times in the rat spinal cord. The study was conducted using a 7T BRUKER BioSpec MRI animal scanner. In the ex-vivo experiments images with the spatial resolution of 100 $\mu$m and the SNR of 1.938 ± 0.010 were acquired in 2 minutes. After optimization both methods were applied in-vivo. The values of FA and $D_{av}$ acquired in this study showed good correlation with the literature values. Furthermore, results from these studies should provide the necessary baseline data for serial DTI in injured spinal cord in future studies.