

UNIVERSITY *of* DELAWARE  
BIOMEDICAL ENGINEERING  
SEMINAR

SEPTEMBER 18, 2014

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*“Understanding why head rotation direction matters.”*

Previously we reported that traumatic axonal injury and neurofunctional outcomes after rapid head rotations are influenced by head rotation direction. We hypothesized that injury is closely correlated with white matter tract deformation, and that these deformations vary with head rotation direction. We used our animal studies to identify relationships between rapid head rotation direction and velocity and regional axonal pathology, diffusion tensor images to de-

fine white matter tract orientation, and computational simulations validated with actual brain tissue displacement in physical model studies, and found that white matter tract-oriented strains and strain rates vary with head rotation direction, and are strongly correlated with traumatic axonal injury. Thresholds for the infant and pre-adolescent differ. These results have implications for traumatic brain injury risk in sports, automotive, and household environments.

11:00am in 311 Pearson Hall. Refreshments served at 10:45am.