Dear Faculty, IGERT Fellows, IGERT Associates and Students,

You are cordially invited to attend a Seminar presented by Virginia Donovan.
Please plan to attend.

Virginia Donovan

IGERT Fellows

Date: Friday, February 14, 2014
Location: Bourns A265
Time: 11:00am

Repeated mild traumatic brain injury results in long term white matter disruption

Abstract:
Mild traumatic brain injury (mTBI) is an increasing public health concern as repetitive injuries can exacerbate existing neuropathology and result in increased neurological deficits. In contrast to other models of repeated mTBI (rmTBI), our study focused on long-term white matter abnormalities following bilateral mTBIs induced 7 days apart. A controlled cortical impact was used to induce an initial mTBI to the right cortex of Single and rmTBI Sprague Dawley rats, followed by a second injury to the left cortex of rmTBI animals. Shams received only a craniectomy. Ex vivo diffusion tensor imaging (DTI), transmission electron microscopy (TEM) and histology were performed on the anterior corpus callosum at 60 days post injury. The rmTBI animals demonstrated a significant bilateral increase in radial diffusivity (myelin), while only modest changes in axial diffusivity (axonal) were seen between the groups. Further, the rmTBI group demonstrated an increased g-ratio and axon caliber in addition to myelin sheath abnormalities using TEM. Our DTI results indicate ongoing myelin changes, while the TEM data demonstrate continuing axonal changes at 60 days post rmTBI. These data suggest that bilateral rmTBI induced 7 days apart leads to progressive alterations in white matter that are not observed following a single mTBI.

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