



[Position for a Ph.D. student in Biomedical Sciences](#)

Site: Hôpital Saint-Luc (CRCHUM)
Faculté de médecine, Université de Montréal
Montreal, Quebec, Canada

Laboratory of: Dr Alan S. Hazell

web site: <http://www.chumtl.qc.ca/crchum/chercheurs/chercheurs-liste/hazell-as.en.html>

Theme of research project: **Excitotoxicity in traumatic brain injury**

The cellular and neurochemical mechanisms in traumatic brain injury (TBI) are heterogeneous and complex. Trauma to the brain as a result of head injury can be divided into two stages. Primary damage consisting of contusions, lacerations, diffuse axonal injury and intracranial haemorrhage occurs at the time of impact. However, secondary damage involving processes that include inflammation, excitotoxicity, oedema, vascular injury, ischemia, necrosis, and ultimately the formation of glial scar tissue is the major contributor to the phenomenon of TBI. Following TBI under both experimental and clinical settings, levels of extracellular glutamate increase acutely. A major contributor to the interstitial glutamate surge following the cerebral insult involves a loss of glutamate transporters and their function. How the loss of glutamate transport function occurs forms the basis of this research project. Understanding this process of post-traumatic glutamate compromise is necessary in order to improve our understanding of the pathophysiology of TBI and to develop new therapeutic strategies. Both in vivo and in vitro models of TBI will be used to study this issue.

References :

1. Jhala, S. and **Hazell, A.S.** (2011) Modeling neurodegenerative disease pathophysiology in thiamine deficiency; consequences of impaired oxidative metabolism. *Neurochem. Int.* 58, 248-260.
2. **Hazell, A.S.**, Sheedy, D., Oanea, R., M. Aghourian, M., Sun, S., Yong, J.J., Wang, D., and Wang, C. (2010) Loss of astrocytic glutamate transporters in Wernicke's encephalopathy. *Glia* 58, 148-156.
3. **Hazell, A.S.** (2009) Astrocytes are a major target in thiamine deficiency and Wernicke's encephalopathy. *Neurochem. Int.* 55, 129-135.
4. Zwingmann, C., Leibfritz, D., and **Hazell, A.S.** (2007) ¹³C-NMR spectroscopic analysis of regional brain energy metabolism in manganese neurotoxicity. *Glia* 55, 1610-1617.
5. Yi, J-H., Herrero, R., Chen, G., and **Hazell, A.S.** (2007) Glutamate transporter EAAT4 is increased in hippocampal astrocytes following lateral fluid-percussion injury in the rat. *Brain Res.* 1154, 200-205.
6. Yi, J-H., Hoover, R., McIntosh, T.K., and **Hazell, A.S.** (2006) Early, transient increase in complexin I and complexin II in the cerebral cortex following traumatic brain injury is attenuated by N-acetylcysteine. *J. Neurotrauma* 23, 86-96.

Disciplines/ Qualifications:

Candidates should have a formal training in biochemistry, physiology, molecular biology or a related discipline, have excellent organizational, interpersonal, and communication skills, and have a strong interest in neuroscience with an emphasis on the neurological sciences.

Contact:

Applicants should submit a resume, university records, a short statement of research interests, and if possible, two letters of recommendation to Dr Alan S. Hazell by email (alan.stewart.hazell@umontreal.ca) (preferably in one pdf document).