

Physics Colloquium

Michigan Technological University

Thursday, October 18, 2012

4:00 pm

Room 139 Fisher Hall

Volatile Anesthetic Interactions with Tubulin Travis Craddock

Department of Medicine, University of Alberta,
Edmonton, Canada

Abstract: The cytoskeleton is essential to cell morphology, cargo trafficking, and cell division. The complex structure of the neuronal cytoskeleton has been implicated to play a role in memory, and a startling number of neurodevelopmental, neurological, and neuropsychiatric disorders show a dysregulation in its function. However, the role of the cytoskeleton in general anesthesia remains poorly understood. Using computational methods involving molecular dynamics simulation, surface geometry based binding site prediction, and small ligand docking procedures we examine the interaction of volatile anesthetics with cytoskeletal microtubules. Results for putative binding sites of anesthetics to microtubules, with the relation to overall cytoskeleton function, are presented, providing insight on the role of the cytoskeleton in anesthetic action and its side effects.



Biography: Travis Craddock received his BSc. in Co-op Physics from the University of Guelph and went on to finish a M.Sc. and Ph.D. in the field of biophysics at the University of Alberta under the supervision of Dr. Jack Tuszynski. His past research activities have investigated subatomic radioactive decay, subneural biomolecular information processing, and nanoscale neuroscience descriptions of memory. Currently he is using a theory driven systems biology approach to investigate neuroendocrine-immune interaction dynamics in relation to GWI, CFS and neuroinflammation.