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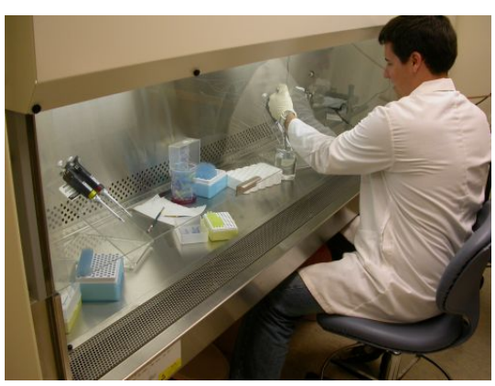
RELAXIN PRODUCTION DURING CEREBRAL ISCHEMIA AND ITS POTENTIAL ROLE IN NEUROPROTECTION

Keefe, Daniel, Dr. Brian Wilson
Department of Biology, Acadia University, Wolfville, NS

The peptide hormone relaxin, a member of the insulin superfamily, has a variety of effects in different organ systems of the mammalian body. Evidence suggests that although relaxin is produced constitutively in cardiac cells, there is an upregulation of production under times of ischemic stress. Relaxin initiates cellular pathways that protect cardiomyocytes under ischemic stress. Relaxin research in the brain mirrors these results as studies of cerebral ischemia have showed that injecting relaxin into the brain before an ischemic stress results in a reduction of the size of the damaged area. This study aims to determine whether relaxin is produced in the brain under ischemic stress to induce neuroprotective physiological responses, and the effectiveness of relaxin in retaining tissue viability after inducing ischemic conditions. Neonatal rat brain slices were cultured and divided among experimental treatments. Using spectroscopy, cultured brain slices in normoxic, hypoxic and hypoxic with relaxin conditions were compared to map the progressive ischemic damage over time and to determine whether relaxin had any effect on reducing the amount of damaged tissue produced. Immunohistochemical analysis of paraformaldehyde-fixed tissue was used to determine whether relaxin is produced in the brain during ischemic conditions compared to normoxic controls. Quantitative real-time PCR will be used to compare relaxin gene expression in ischemic and normoxic slices as well. Experiments for all three portions of this research are ongoing; however, initial spectroscopic data suggest there is an absorbance signature associated with slices exposed to ischemic conditions that may permit the use of spectroscopy to track ischemia-related changes in these slices. Future research will determine if relaxin does confer neuroprotective effects under ischemic conditions as seen in other organs, or whether relaxin may act as a potential pharmaceutical agent to combat the negative effects of cerebral ischemia.



Daniel Keefe graduated from Three Oaks Senior High School in Summerside, Prince Edward Island in 2006. Daniel is currently completing his Honours thesis in his fourth year of Biology at Acadia University. Upon high school graduation, Daniel received a four year renewable entrance scholarship to Acadia and has since been named to the Dean's list for the past two years. He has also received an NSERC undergraduate research award to fund his honours research. Daniel volunteers his time as a leader in the SMILE program and sits on the Acadia biology society executive as the Vice-President of Programming. Daniel hopes to attend medical school in the near future and become a physician practicing back home on PEI.