



# Biology @ Acadia

## THE NEUROPROTECTIVE EFFECTS OF RELAXIN-3 DURING ISCHEMIA AND THE ROLE OF NITRIC OXIDE: A STUDY USING ORGANOTYPIC RAT BRAIN CULTURES

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In humans, relaxins are a group of 3 peptide hormones within the insulin peptide superfamily, which have a wide range of effects in animals. The main circulating form of relaxin has been shown to reduce the cellular damage associated with ischemia, a lack of oxygen resulting from decreased perfusion in tissues of organs including the heart, intestine and pancreas. Previous results from our lab have shown that recombinant human relaxin-2 (H2 relaxin) protects brain tissue from ischemic damage. This study was a two-pronged investigation of the effects of recombinant human relaxin-3 (H3 relaxin), a relaxin neuropeptide, on damage to the brain during ischemia and reperfusion as well as an examination of the role of nitric oxide (NO) as a mediator. The study was performed *in vitro* using brain slices from the brains of 10-11 day old neonatal rats. Slices were exposed to one of seven possible treatments: Baseline, control, oxygen and glucose deprived (OGD), OGD with H2 relaxin, OGD with H2 relaxin and a blocker of inducible nitric oxide Synthase (iNOS), OGD with H3 relaxin and OGD with H3 relaxin and a blocker of iNOS. Propidium iodide (PI) fluorescence was used to quantify the number of dead cells in the slices. H3 relaxin treated slices had significantly reduced numbers of PI positive, or dead, cells compared to untreated slices. It is possible that H3 relaxin was perhaps more effective than H2 relaxin at protecting neural tissue though this was not significant. Blockade of inducible NO synthase (iNOS) significantly attenuated the effect of both relaxins. These data suggest that both H2 and H3 are neuroprotective and that NO mediates this effect, at least in part. Overall, these findings show that H3 relaxin, like H2 relaxin is neuroprotective in rat brain tissue under ischemic stress. These findings are the first to demonstrate this using a rat brain slice culture system. Ultimately, the application of these data may lead to a better understanding of relaxin physiology in the brain and point towards clinical use of these peptides in patients who suffer strokes.

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graduated from Central Kings Rural High School in Cambridge Station, Nova Scotia in 2008. He is currently completing his Honours thesis in your 5th year in Biology at Acadia. He received scholarships and awards from Acadia University, but funded much of his education by working part-time throughout his time at Acadia. Nick was a member of the Varsity Men's



Soccer Team before joining the staff of the Varsity Men's Basketball Team and hope to complete his Master's in the coming years before entering Medicine.

