

**Douglas Burns: Cell Biology & Neuroscience**  
**Mentor: Roger Bradley -- Cell Biology & Neuroscience**  
***Relative Onset of NFPC in Xenopus Development***

Development of the central and peripheral nervous systems in vertebrates involves an epithelial to mesenchymal transition mediated by a host of developmental proteins. The transcription of these protein's genes occurs in a stepwise manner, each one determining a given cell's developmental fate. Neural Fold ProtoCadherin (NFPC) is a developmental protein involved in the formation of neural crest, the tissue that later will form the peripheral nervous system. Past experiments have revealed that when NFPC mRNA is prevented from translation, the cells enter apoptosis; when rescued from apoptosis the embryos have significantly impaired motor function as well as impaired cartilage and eye development (Bradley, R. PhD). These results indicate a crucial role for NFPC in neural crest development. The goal of this research was therefore to determine the time of onset relative to other known neural crest developmental genes. Protocadherins are a relatively new category of biomolecules and their purposes are many, far exceeding those of classical cadherins. It is, however, likely that NFPC functions much like a classical cadherin; binding homophilically to neighboring cells. Therefore a logical next step for future research is to determine what molecules NFPC binds to intracellularly and what functions and signaling cascades these are part of. Given the prevalence of protocadherins across vertebrates, it would then be interesting to search for corresponding molecules and their functions in human development.