

Rachel Ruggles: Cell Biology & Neuroscience
Mentor: Roger Bradley -- Cell Biology & Neuroscience
Rescuing NFPC defects in Xenopus Embryos

Neural Fold protocadherin (NFPC) is a type of cadherin required for cell adhesion and is required for ectodermal differentiation during embryonic development. One method to study the function of NFPC is to inhibit translation of it, thereby making a functional knockout. Morpholinos are often used in this process due to their ability to bind to mRNA and prevent protein translation. When NF-protocadherin is inhibited in *Xenopus laevis* embryos using anti-NF-protocadherin morpholino, defects in the neural tube are observed. To test the specificity of these defects, we plan to rescue these defects by ectopically expressing full length NFPC. Embryos will be injected with the morpholino together with an altered NF-protocadherin mRNA that the morpholino will not bind to. In one approach, the region of mRNA the morpholino binds to is modified by changing enough nucleotides to maintain the same protein sequence while introducing enough mismatch to prevent the morpholino from binding. In the second approach, a primer is engineered to begin translation of the mRNA downstream of the normal start site thereby eliminating the morpholino binding site. If we can successfully rescue the neural tube defects, we can prove the defects are specific to knocking down NFPC.