

## **Does Aquaporin 3b Affect The Number and Characteristics of Calcium Waves in The Neural Plate of *Xenopus Laevis* Embryos?**

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Early in the development of the nervous system, vertebrate embryos undergo neural tube closure. During this process, the cells in the dorsal part of an embryo, the neural plate, constrict on their outward facing side (apical constriction) to form a tube. The Merzdorf lab has found that expression of the Aquaporin 3b (Aqp3b) protein in *Xenopus laevis* (African clawed frog) embryos is critical for neural tube closure, specifically for apical constriction of the cells of the neural plate. While aqp3b is only expressed in a well-defined line along the outer edge of each side of the neural plate, it affects a pan-neural plate process. Thus, the question my study attempts to answer is how Aqp3b signals to the rest of the neural plate. A likely candidate for the signal is calcium, a common intercellular and cellular signal. I hypothesize that the neural plate in embryos with inhibited Aqp3b expression will have fewer calcium waves and/or calcium waves with different characteristics. To test this hypothesis, the number and characteristics of calcium activity will be compared between control embryos and embryos that have been inhibited from expressing Aqp3b. This is accomplished by injecting a morpholino oligonucleotide, which inhibits Aqp3b expression, and GCaMP6, which is fluorescent in the presence of calcium, into frog embryos at the four-cell stage. I then collect time lapses of calcium activity that occurs during neural tube closure and analyze them for differences in the length, period, intensity, etc. of calcium signaling events using a variety of software. As my project continues, I will continue to collect data and begin to draw a conclusion on it.