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Role of Zic Family of Transcription Factors in Early Neural Development

A screen for genes that are regulated by Zic transcription factors identified a gene that proved to be an aquaporin (*aqp-3b*) (Cornish et al., 2009). Inhibition of this aquaporin suggests that it is required for proper neural tube closure. Neural tube closure defects are seen in 1 in every 500 births (Gilbert et al., 2006), and are due to such improper neural tube closures. Since mutations in Zic2 or Zic3 genes in mouse and humans are known to cause neural tube defects (Merzdorf, 2007), our hypothesis stated that either Zic2 or Zic3 regulates the aquaporin that aids in closing the neural tube. Morpholino oligonucleotides (MOs) were used to address which Zic gene regulates *aqp-3b*, starting with Zic3. Contingently, other genes in the Zic family would have been tested if Zic3 proved not to regulate *aqp-3b*. In this case, Zic1, Zic2, Zic4, and Zic5 would have been researched. Additionally, direct target genes of Zic transcription factors, including *tnrc4*, *Xl.25952*, and *Xl.8933* (Cornish et al., 2009), could have been tested. However, during the summer time only allowed for the testing of Zic3.