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***Gap junctions in the development of the nervous system***

Gap junctions are intercellular ion channels composed of two intermembrane protein complexes called connexons, which are bound together forming an intercellular pore. These pores then allow for passive transport of small molecules and ions. Calcium along with other ions that move through these gap junctions are known to be involved in intercellular communication. We hypothesize that intercellular signaling through gap junctions helps begin, direct, and end developmental processes such as convergent extension in the embryonic stages of gastrulation and neurulation. I have begun to determine at which stages gap junction proteins (connexins) are expressed. To do this cDNA (DNA reverse transcribed from RNA isolated from blastula, gastrula and neurula Xenopus laevis embryos) was used as a template for PCR with primers specific to each connexin. The PCR products were analyzed by gel electrophoresis (the primers had been tested previously and were known to be functional). By using this form of PCR we were able to determine what genes were expressed at what stages. The connexin 46 and connexin 43.4 genes were found to be expressed at stages 18 and 20 (late neurula and early tailbud), while connexin 30 was found to be expressed at stages 12-20 (late gastrula through early tailbud). There were several connexin genes, which were not expressed at the stages that were tested. The next step is to determine the expression patterns of the expressed genes through in situ hybridization of gastrula and neurula Xenopus embryos.