

RING finger proteins in crossover designation and interference

The RING Finger proteins Vilya, Narya, and Nenia (VNN) are believed to facilitate crossover designation in meiosis. If crossing over occurs incorrectly, it can result in nondisjunction which can cause genetic conditions like Down Syndrome. VNN are found concentrated in the synaptonemal complex, a structure that forms between chromosomes during meiosis, in locations where crossovers occur. Because of this, we believe that increases in expression of these genes will lead to an increase in crossovers and a decrease in crossover interference. In order to test the role of VNN, a transgene containing the three genes was assembled using a UAS::GAL4 promoter system via Goldenbraid cloning. The completed transgene was injected into *Drosophila* and paired with a nanos driver to amplify expression. When compared to a negative control, it was found that there are higher rates of crossovers due to higher expression of VNN, indicating that crossover interference also lessens as predicted. Further research to increase our understanding of the genes includes analyzing the VNN transgene with different drivers and creating marked deletions for each individual gene to look at their effects. In order to quantify the dosage of VNN, we also plan on performing qRT-PCR.