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Genetic Differences in the Serotonin Transporter Gene and Oxytocin Receptor Gene and its Association with Emotional Sensitivity

The promoter region of the serotonin transporter gene has been observed to have a polymorphism, or a genetic variation, that is associated with anxiety-related traits (Lesch et al., 1996). This polymorphism (5-HTTLPR) of the promoter region, a site necessary for gene transcription, produces homozygous individuals with short allele (S/S) and long allele (L/L) genotypes, and a heterozygous (S/L) genotype. 5-HTTLPR polymorphisms have been found to play a role in emotional processing where S carriers (S/S or S/L) were found to be more sensitive to emotional stimuli than those with the L/L allele (Jonassen & Landro, 2014). A similar model has been found in the oxytocin receptor gene (OXTR) where a polymorphism is responsible for homozygous individuals with A allele (AA) and G allele (GG) genotypes, and a heterozygous genotype (AG). A carriers (AA or AG) were found to be more reactive to stressful situations than those homozygous for the G allele (Rodrigues et al., 2009). To date, there have been no published studies on both the serotonin transporter gene and oxytocin receptor gene and how they relate to emotional sensitivity.

In this study we are investigating sensitivity to emotional stimuli in the context of genetic polymorphisms in the serotonin transporter gene and the oxytocin receptor gene. Using DNA isolation techniques, polymerase chain reactions, and gel electrophoresis, these polymorphisms can be analyzed. Sensitivity to emotional stimuli can be observed using the Dot Probe Task which is designed to test fixation with emotional stimuli. The data collected are expected to show that participants having the S/S and AA/AG alleles are more sensitive to emotional stimuli. Studies such as these are instrumental to understanding the genetic basis of depression and anxiety disorders, as well as the development of individualized treatment for these disorders.