

The Evolutionary Origins of Autism Associated Genes and Their Role in Great Ape Socio-Communication

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Single nucleotide polymorphisms (SNPs) play a major role in socio-communicative behavior. For this study, the focus is on OXTR, AVPR1A, and FOXP2 SNPs, and the role they play in great apes. Prior research on the autism associated OXTR, AVPR1A, and FOXP2 SNPs show that they affect behavior skills such as understanding and controlling emotion, understanding the emotions of others, and communications skills. Great apes, such as bonobos, chimpanzees, and gorillas are the model, since they are our closest relatives in the animal kingdom capable of understanding complex communication. Each gene has at least two SNPs that are investigated in the three species. One of the aims for this study is to locate and align these SNPs between the three great apes and humans. The purpose of this aim was to assess what the reference and alternate alleles are for humans and see if the reference allele is shared amongst all four species. The aim was conducted using the UCSC browser. Each SNP was found in the alignment by using their rs numbers, and the reference and alternate alleles were documented. Initial results have revealed that humans can share the same reference allele as bonobos, chimpanzees, and gorillas; however, there are locations where humans differ from the great apes. More specifically, the human alternate allele is the reference allele for great apes. Research on how these genes affect the great apes would provide insight on how the SNPs affect socio-communicative behavior and genetic factors that influence great ape species differences.

Keywords: Single nucleotide polymorphism, socio-communicative behavior, OXTR, AVPR1A, FOXP2, autism