Is it Williams Syndrome? GTF2I implicated in Social-Spatial Construction Revealed by High Resolution Arrays

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Abstract

Genetic contributions to human cognition and behavior are clear but difficult to define. Williams syndrome (WS) provides a unique model for relating certain genes to intelligence and social behavior. We defined a 1.5 Mb region of chromosome 7q11.23 as a candidate for Williams syndrome (Huang et al., 2005). This region was associated with the genes GTF2IRD1 and GTF2I. To dissect the role of GTF2IRD1 and GTF2I in VSC and social behavior, we developed multiple genomic reagents (a custom high resolution oligonucleotide array spanning 461 Mb of the region) with functional annotations (genes, copy number variation) and somatic cell hybrid lines to map more precisely the breakpoints relevant to WS.

Techniques

I. Oligonucleotide Isothermal High Resolution DNA tiling array

II. Whole Genome BAC tiling Array: High Resolution Fluorescence in situ hybridization (FISH)

III. Southern blotting and PCR

IV. Psychometric Testing

Conclusions

Integration of neurogenetic analyses of rare individuals provides powerful clues to the neurobiology of human social behavior. Our results support the hypothesis that expression in genes distal to CYL2, GTF2IRD1, GTF2I contribute to WS behavior as measured in neurocognitive and behavioral domains. This model extends the concept of shared genetics and molecular alterations underpinning individual differences in social behavior and points to further study of genes contributing to social behavior in atypical and typical deletion WS.

References


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