

Evidence From Turner's Syndrome of an Imprinted X-Linked Locus Affecting Cognitive Function

The investigators studied 80 Turner syndrome (TS) patients with a single X chromosome. In 55 patients, the X was maternally derived (45,X^m) and in 25, paternally derived (45,X^p). Members of the 45,X^p group were significantly better adjusted, with superior verbal and higher order executive function skills, which mediate social interactions.

The investigators conclude that the observations suggest there is a genetic locus for social cognition that is imprinted by the X^p in TS patients and not by the X^m. Neuropsychological and molecular investigations of 8 females with only partial deletions of the short arm of the X chromosome indicated that the putative imprinted locus escapes X-inactivation, and probably lies on Xq or close to the centromere on Xp. If this locus is expressed only from the X chromosome of paternal origin, the existence of this locus could explain why 46,XY males, who always have a maternally derived X, are more vulnerable to developmental disorders of language and social cognition, such as autism, than are 46,XX females.

The techniques used in differentiating the behavioral differences of 45,X^p from 45,X^m are listed in the Table. The 2 groups, as compared with normal 46,XY and 46,XX, are presented in the Figure.

Skuse DH, et al. *Nature* 1997;387:705-708.

Scale for Measuring Social Cognition

Complete the following section by circling 0 if the statement is not at all true of your child, 1 if it is quite or sometimes true of your child, and 2 if it is very often true of your child:

0	1	2	• lacks an awareness of other people's feelings
0	1	2	• does not realize when others are upset or angry
0	1	2	• is oblivious to the effect of his/her behavior on other members of the family
0	1	2	• behavior often disrupts normal family life
0	1	2	• is very demanding of people's time
0	1	2	• is difficult to reason with when upset
0	1	2	• does not seem to understand social skills, eg, interrupts conversation
0	1	2	• does not pick up on body language
0	1	2	• is unaware of acceptable social behavior
0	1	2	• unknowingly offends people with behavior
0	1	2	• does not respond to commands
0	1	2	• has difficulty following commands unless they are carefully worded

Internal consistency for set of 12 questions: Standardized item alpha 0.94

Editor's comment: *The hypothesis presented and the evaluation and testing of the hypothesis are unique and reflect the contributions of an important subgroup of investigators—specifically, the neuropsychoneuroendocrinologists. Collaboration of neuropsychoneuroendocrinologists with pediatric endocrinologists, geneticists, psychiatrists, and others is significantly contributing to therapeutic considerations with which endocrinologists and geneticists deal.*

The hypothesis of these investigators is not totally proven as there are other possible explanations for the findings, but the possible correctness of the hypothesis as demonstrated by the investigators will stimulate further and related studies that may expand our knowledge of the relationships between imprinting, growth, intellect, and social or cognitive function. Watch for further studies and developments.

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