Severe mental retardation gene mutation identified

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Researchers have identified a novel gene mutation that causes X-linked mental retardation for which there was no previously known molecular diagnosis, according to an article to be published electronically on Tuesday, March 20, 2007 in *The American Journal of Human Genetics*.

Investigators F. Lucy Raymond (Cambridge Institute of Medical Research, University of Cambridge, Cambridge, UK) and Patrick S. Tarpey (Wellcome Trust Sanger Institute, Hixton, UK) describe the ZDHHC9 gene found in those with severe retardation as being mutated to the point of entirely losing function.

"ZDHHC9 is a novel gene," explains Dr. Raymond. "This gene would not have been predicted to play a role in mental retardation based on the previous genetics work. It was found only because we were systematically looking at all the genes on the X chromosome irrespective of what they do."

X-linked mental retardation is severe. Some patients require total care and may not have language ability. The condition runs in families and only affects the male offspring. So far only a few of these genes have been identified.

Working through a large, international collaboration, the researchers collected genetic samples from 250 families in which at least two boys have mental retardation to help identify novel genes that cause X-linked mental retardation. The investigators systematically analyzed the X

chromosome for gene mutations.

Dr. Raymond says that the families are receiving information from the study and using it to make decisions in their lives. "We cannot currently make their children better, but knowing that we found a genetic abnormality gives them an explanation for what has happened," she explains. "We had one family that said this knowledge was the best news they had ever been given."

"We have identified the cause of problems in certain families and are able to tell whether or not women are carriers of the condition," Dr. Raymond comments. "Consequently, the families that had previously chosen to forego having children because there was no method of testing can now be tested. We have been able to test a substantial number of people to identify whether are not they are carriers, and we can offer prenatal testing to the carriers who want it."

In the broader picture, this research is not only benefiting families with X-linked mental retardation, but it is also defining the genes involved in intellectual development. "If you find genes that are abnormal, it is a reasonable assumption that the identified genes are involved in the formation of normal intellectual processing as well," concludes Dr. Raymond.

Now that a posttranslational modification enzyme has been found to be mutated in X-linked mental retardation, the researchers expect to find similar genes related to other mental retardation syndromes.

Source: University of Chicago