Association between mutations in a thyroid hormone transporter and severe X-linked psychomotor retardation

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Monocarboxylate transporter 8 (MCT8) is a thyroid hormone transporter, the gene of which is located on the X chromosome. We tested whether mutations in MCT8 cause severe psychomotor retardation and high serum triiodothyronine (T3) concentrations in five unrelated young boys. The coding sequence of MCT8 was analysed by PCR and direct sequencing of its six exons. In two patients, gene deletions of 2·4 kb and 24 kb were recorded and in three patients missense mutations Ala150Val, Arg171 stop, and Leu397Pro were identified. We suggest that this novel syndrome of X-linked psychomotor retardation is due to a defect in T3 entry into neurons through MCT8, resulting in impaired T3 action and metabolism.