

**The American Journal of Human Genetics, Volume 89
Supplemental Data**

***ST3GAL3* Mutations Impair the Development
of Higher Cognitive Functions**

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Table S1. Mutation Details

Patient/Family	Mutation in <i>ST3GAL3</i>	Supporting Reads	Allelic percentage	PhyloP44 vertebrate^a conservation score
M096	NM_006279.2: c.38C>A, p.Ala13Asp	13	93	3.881
M319	NM_006279.2: c.1108G>T p.Asp370Tyr	27	100	5.496

^a[<http://hgdownload.cse.ucsc.edu/goldenPath/hg18/database/phyloP44wayAll.txt.gz>]

Table S2. Clinical Features

Family	Individual	Sex	Age [y] at examination	IQ	Height [cm]	OFC ^a [cm]	Additional features
M096	VI:8	f	35	40	159	54	-
	VI:9	m	34	25	164	57	-
	VI:10	m	40	30	160	55	
	VI:14	m	26	35	178	54	-
	VI:15	m	17	40	150	53	severe kyphosis
	VI:16	f	22	45	155	53	
	VI:18	f	18	55	150	51	
	VI:19	f	15	40	146	52	
M319	IV:3	m	34	30	165	54	brachydactyly (left foot)
	V:1	m	17	40	172	52	
	V:2	f	16	40	163	53	-
	V:5	m	4	50	101	48	-

^aOccipitofrontal circumference

Table S3. Cloning Strategies

Plasmid	Primers	Template	Cloning	Vector
ST3Gal-III ^{wt}	5'-GACTAAGCTTATGGGACTCTTGGTATTTG TG-3'	cDNA (splice variant B1, accession no. NM_006279.2) purchased from Origene (RC208261)	HindIII/NotI	pcDNA3 (Invitrogen)
	5'-GATCGCGGCCGCTCAGATGCCACTGCTTA GATCAGTG-3'			
ST3Gal-III ^{Ala13Asp}	5'-GCGCAATCTGCTGCTAGATCTCTGCCTCT TTCTGG-3'	pcDNA3-ST3Gal-III ^{wt}	site-directed mutagenesis	pcDNA3 (Invitrogen)
	5'-CCAGAAAGAGGCAGAGATCTAGCAGCAG ATTGCGC-3'			
ST3Gal-III ^{Asp370Tyr}	5'-GCTCGGTCATCACTTACCTAAGCAGTGG CATCTGAG-3'	pcDNA3-ST3Gal-III ^{wt}	site-directed mutagenesis	pcDNA3 (Invitrogen)
	5'-CTCAGATGCCACTGCTTAGGTAAGTGATG ACGCGAGC-3'			
ST3Gal-III ^{wt} -myc	5'-GATCGCGGCCGCTCGATATGGGACTCTTG GTATTTGTGCG-3'	pcDNA3-ST3Gal-III ^{wt}	XbaI/NotI	pcDNA3.1-Myc/His A (Invitrogen)
	5'-GTAGTCTAGAGATGCCACTGCTTAGATCA -3'			
ST3Gal-III ^{Ala13Asp} -myc	5'-GATCGCGGCCGCTCGATATGGGACTCTTG GTATTTGTGCG-3'	pcDNA3-ST3Gal-III ^{A13D}	XbaI/NotI	pcDNA3.1-Myc/His A (Invitrogen)
	5'-GTAGTCTAGAGATGCCACTGCTTAGATCA -3'			
ST3Gal-III ^{Asp370Tyr} -myc	5'-GATCGCGGCCGCTCGATATGGGACTCTTG GTATTTGTGCG-3'	pcDNA3-ST3Gal-III ^{D370Y}	XbaI/NotI	pcDNA3.1-Myc/His A (Invitrogen)
	5'-GTAGTCTAGAGATGCCACTGCTTAGGTAA -3'			
ProtA-Δ40-ST3Gal-III ^{wt}	5'-CAGTGGTTCTTTCTTTGACTCCG-3'	cDNA (splice variant B1, accession no. NM_006279.2) purchased from Origene (RC208261)	blunt end ligation into EcoRI site	pPROTA ²⁵
	5'-TCAGATGCCACTGCTTAGATCAGTG-3'			
ProtA-Δ40-ST3Gal-III ^{Asp370Tyr}	5'-GCTCGGTCATCACTTACCTAAGCAGTGG CATCTGAG-3'	ProtA-Δ40-ST3Gal-III ^{wt}	site-directed mutagenesis	pPROTA ²⁵
	5'-CTCAGATGCCACTGCTTAGGTAAGTGATG ACGCGAGC-3'			