Supporting Information

Abundant co-pathologies of polyglucosan bodies, frontotemporal lobar degeneration with TDP-43 inclusions, and aging-related tau astrogliopathy in a family with *GBE1* mutation

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Supplementary Table S1. Variants present in all affected siblings and absent in unaffected siblings.

GENE	HGVS Coding	HGVC Protein	Type	Mutation Taster	Polyphen2	CADD_Phred	SIFT
GBE1	c.1280delG	p.Gly427Glufs*9	Frameshift LOF	NA	NA	NA	NA
PRKG2	c.1265C>T	p.Ser422Phe	Missense	Disease causing	Benign	20.6 Likely benign	Deleterious
IL1R2	c.430T>G	p.Leu144Val	Missense	Polymorphism	Benign	0.039 Likely benign	Tolerated
EPAS1	c.2272G>A	p.Ala758Thr	Missense	Polymorphism	Benign	1.749 Likely benign	Tolerated

Supplementary Table S2. Cases used for western blotting.

	Age	Sex	NPDx	GBE1 expression
II-1	~75	-	APBD / FTLD-TDP / low ADNC / HS / ARTAG	40.0 %
II-5	~75	-	APBD / FTLD-TDP / high ADNC / HS / ARTAG	17.6 %
Control 1	70	M	Unremarkable brain	
Control 2	66	M	Unremarkable brain	
Control 3	76	M	PART	
Control 4	72	F	PART	
Control 5	72	F	PART	

Abbreviations; ADNC, Alzheimer's disease neuropathologic change; AGD, Argyrophilic grain disease; APBD, adult polyglucosan body disease, ARTAG, Aging-related tau astrogliopathy; FTLD-TDP, Frontotemporal lobar degeneration with TDP-43 inclusions, HS, hippocampal sclerosis; PART, primary age-related tauopathy.

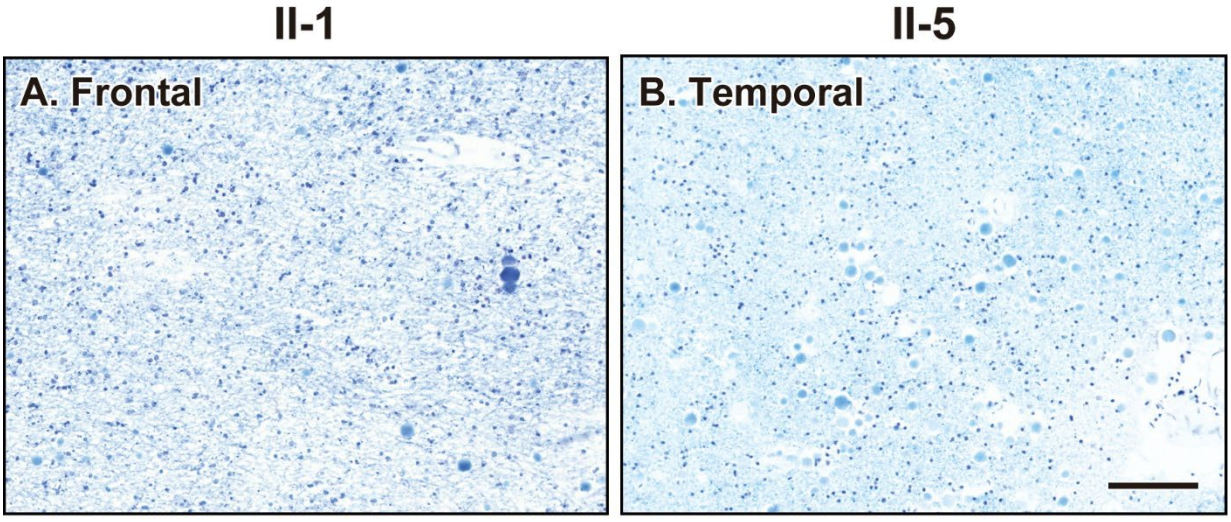
Supplementary Table S3. PBs, TDP-43, and ARTAG co-pathologies in II-1 and II-5.

		PBs		TDP-43		ARTAG	
		II-1	II-5	II-1	II-5	II-1	II-5
Amygdala	GM	-	±	++	+++	+	-
	WM	+++	+++	-	-	+++	+++
	SVZ	-	+	-	-	+	+
Dentate Gyrus	GM	+	+	+	+	-	++
	WM	+	+++	-	-	-	+++
Cornu Ammonis	GM	+	-	+	+	-	+
	WM	+++	+++	-	-	+++	+++
	SPM	++	++	-	-	-	++
Entorhinal Cortex	GM	+	-	++	+++	-	±
	WM	+++	+++	-	-	-	+++
	SPM	+	++	-	-	-	++
Cingulate Gyrus	GM	-	-	+	+	-	-
	WM	++	++	-	-	-	++
	SPM	++	+	-	-	+	++
Middle Frontal Gyrus	GM	-	-	+++	+	-	-
	WM	+	+++	-	-	-	+++
	SPM	+	+	-	-	-	+
Motor Cortex	GM	-	-	+	+	-	-
	WM	++	++	-	-	-	++
	SPM	+++	++	-	-	+	+
Angular Gyrus	GM	-	-	+	++	-	-
	WM	++	++	-	-	-	++
	SPM	+++	+++	-	-	±	+
Superior/Middle Temporal Gyrus	GM	-	-	+++	+++	-	-
	WM	+	+++	-	-	-	+++
	SPM	++	++	-	-	++	++
Occipital lobes	GM	-	-	+	-	-	-
	WM	++	+++	-	-	-	-
	SPM	+++	+++	-	-	+	+
Striatum	GM	-	+	+	+	-	-
	WM	+	+++	-	-	++	++
	SVZ	+	++	-	-	++	+++
Thalamus	GM	-	-	++	±	-	-
	WM	++	++	-	-	+	+++
	SVZ	++	+++	-	-	+	+++

Midbrain	GM	-	-	+	-	-	-
	WM	++	++	-	-	++	+
	SPM	++	++	-	-	++	+++
Pons	GM	-	+	-	-	-	-
	WM	++	+	-	-	+	+
	SPM	++	++	-	-	++	++
Medulla	GM	++	++	+	+	++	-
	WM	++	++	-	-	++	++
	SPM	++	++	-	-	+	+++
Cerebellum	GM	±	+	-	-	-	-
	WM	+++	++	-	-	-	±
	SPM	-	-	-	-	-	-
Cervical Spinal Cord	GM	+	±	+	+	++	-
	WM	++	+	-	-	-	-
	SPM	±	+	-	-	-	-

Abbreviations; GM, gray matter; SPM, subpial matter; SVZ, subventricular zone, WM, white matter

Supplementary Figure S1. White matter attenuation in II-1 and II-5



Klüver-Barrera (KB) staining of (A) II-1 (frontal lobe, white matter) and (B) II-5 (temporal lobe, white matter). Severe white matter damage with loss of myeline structures is observed in both cases.