Supplementary Table

Gene	Mutation	Chr	Position (GRCh37)	ref	alt	1000 Genomes				NHLBI Exomes		UK10K		ODEX	dbSNP
						EUR	AMR	AFR	ASN	EA	AA	Cohorts	Exomes	Exomes	v137
POC1A	**Q350Rfs*4**	3	52130662	G	-	a	a	a	a	a	a	a	0.0002	a	a
CADPS	**R884S**	3	62484893	G	T	a	a	a	a	a	a	a	0.0002	a	a
CACNA2D2	**I552V**	3	50413592	T	C	a	a	a	a	a	a	a	0.0002	a	a
RSAD1	**D249H**	17	48559722	G	C	a	a	a	a	0.0013	0.0005	0.0015	0.0009	a	rs137932823
TMEM44	**Y94H**	3	194346704	A	G	0.0026	0.0000	0.0000	0.0000	0.0020	0.0002	0.0013	0.0021	0.0012	rs140271606
TTN	**A9429G**	2	179553857	G	C	a	a	a	a	a	a	a	0.0002	a	a
TTN	**L16074Q**	2	179465706	A	T	0.0013	0.0000	0.0000	0.0000	0.0007	0.0002	0.0005	0.0005	a	rs140714512

Supplementary Table 1. Rare homozygous variants found in the proband. Chromosome positions are relative to NCBI build 37. Ref refers to the NCBI reference sequence allele, alt refers to the alternate allele. Non-reference allele frequencies are given for a) 1000 Genomes (release 2012-07-19) - EUR (European ancestry), AMR (from the Americas), AFR (West African ancestry), ASI (East Asian ancestry); b) NHLBI Exome Variant Server (release ESP6500SI-V2, Apr-2013) – EA (European American ancestry), AA (African American ancestry); c) 3,781 Genomes from the UK10K Cohorts group (UK10K Cohorts, release 2012-06-02) - all of European ancestry d) 5,233 Exomes from the UK10K Exomes group (UK10K Exomes, release 2013-04-20) and e) 409 CoLaus Exomes (ODEX, release Dec-2010) - all of European ancestry. Variants absent from the control populations are labelled "a". TMEM44 is an integral membrane component with ubiquitous expression. CADPS encodes a calcium binding protein involved in exocytosis, vesicle organisation and catecholamine secretion. CACNA2D2 is a subunit of voltage-dependent calcium channels, regulating calcium current density and channel activation/ inactivation kinetics. Targeted disruption in mice causes growth retardation, decreased lifespan, ataxia, seizures and cardiac anomalies (Ivanov et al, Am J Pathol. 2004 Sep;165(3):1007-18), while a homozygous frameshift mutation has been associated with cerebellar ataxia and epilepsy in humans (Pippucci *et al*, PLoS One. 2013 Dec 16;8(12):e82154). RSAD1 has been proposed to play a role in porphyrin cofactor biosynthesis and a mouse knock out showed no relevant phenotype (IMPC). TTN is a large, highly polymorphic gene playing a key role in muscle assembly and contraction.