

KCNJ8	x									
KCNQ1		x	x							x
LAMP2					x					
LDB3						x	x	x		x
LMNA						x	x	x		
MYBPC3					x	x		x		x
MYH6					x	x				x
MYH7					x	x		x		
MYL2					x					
MYL3					x					
MYLK										
MYLK2					x	x				
MYOZ2					x					
MYPN					x	x				
NEXN					x	x				
NKX2-6										
NOS1AP		x								
PKP2					x	x	x			
PLN	x				x		x	x		
PRKAG2					x					
PSEN2						x				
PTPN11					x					
RAF1					x					
RANGRF	x									
RBM20						x				
RIT1					x					
RYR2		x		x			x	x		x
SCN10A	x									x
SCN1A										x
SCN1B	x	x								x
SCN2B	x									
SCN3B	x									
SCN4B		x								
SCN5A	x	x				x				x
SCN8A										x
SEMA3A	x									
SGCD						x				
SLC8A1							x			
SLMAP	x									
SNTA1		x								
TAZ						x		x		
TCAP					x	x				
TECRL	x			x						
TGFB2										
TGFB3							x			
TMEM43							x			
TMPO						x				
TNNC1					x	x				
TNNI3					x	x				
TNNT2					x	x		x		
TPM1					x	x		x		

TRDN		x		x						
TRPM4	x									
TTN					x	x	x			
TTR					x				x	
VCL						x				

Table S1: It shows the list of genes present in the updated panel used for analysis of samples 3, 4 and 5. 103 genes (V2) are collected in the tables, 97 were present also in the past custom gene panel (V1). The genes added to the latest version were DEPDC5, DTNA, GAA, PTPN11, SCN1A, SCN8A. In particular, DEPDC5, SCN1A and SCN8A are involved in SUDEP.

BrS: Brugada Syndrome

LQTS: Long QT Syndrome

SQTS: Short QT Syndrome

CPVT: Catecholaminergic polymorphic ventricular tachycardia

HCM: Hypertrophic cardiomyopathy

DCM: Dilated cardiomyopathy

ARVC: Arrhythmogenic right ventricular cardiomyopathy

LVNC: Left ventricular noncompaction cardiomyopathy

ATTR: Transthyretin amyloid cardiomyopathy (ATTR-CM)

SUDEP: Sudden and Unexpected death in Epilepsy

Sample Name	Clinical Context	DNA extraction kit	Sequencing Platform	Gene Panel	Key Variants
Sample 1 FFPE	Definite SUDEP	Casework Kit	Ion PGM	V1	
Sample 2 FFPE	Definite SUDEP	Casework Kit	Ion PGM	V1	
Sample 3 FFPE	Definite SUDEP	Casework Kit	Ion GeneStudio S5	V2	
Sample 4 Whole blood	Definite Plus SUDEP	CSC Genomic DNA Kit	Ion GeneStudio S5	V2	NM_001035.3(RYR2):c.14302G>A p.(Val4768Ile) NM_001330260.2(SCN8):c.1903C>T p.(Arg635Cys)
Sample 5 Whole blood	Definite SUDEP	CSC Genomic DNA Kit	Ion GeneStudio S5	V2	NM_005751.5(AKAP9):c.3708A>T p.(Glu1236Asp)

Table S2: Case Summary Table. It summarizes the most relevant findings (key variants and the clinical significance).

V1: Gene Panel version 1 (97 genes)

V2: Gene Panel version 2 (103 genes)