

**Supplemental Table S1:** List of variants

	Gene	Position (GRCh38)	Amino acid change	HGVSc	ACMG classification*
1	SCN5A	chr3:38606806	p.Cys335Arg	SCN5A(NM_198056.3):c.1003T>C	Likely Pathogenic (PM1;PM2;PP2;PP3;PP5)
2	TTN	chr2:178571140	p.Ser24998LysfsTer28	TTN(NM_001267550.2):c.74987_74991dup	Pathogenic (PVS1;PM2;PP5;PP3)

**Supplemental Table S2:** Patient characteristic before and after CRT implantation

	Before CRT implantation							about 1 year After CRT implantation						
Patiens	EF	NYHA	LVEDD	NT-ProBNP	MR	6MWT	QRS	EF	NYHA	LVEDD	NT-ProBNP	MR	6MWT	QRS
III.2	NA	II	NA	NA	NA	NA	220	15	III	57	11293	I°	228	228
III.3	38	II	57	812	-	441	256	35	II	56	1827	I°	463	223
III.10	35	II	55	727	I°	422	212	35	II	55	1825	I°	425	201
III.14	NA	II	NA	NA	NA	NA	166	25	II	58	834	I°	NA	195

**Supplementary table S3:** The list of the genes for panel sequencing.

gene	ENSEMBL ID
ABCC9	ENSG00000069431
ACTC1	ENSG00000159251
ACTN2	ENSG00000077522
ADRB1	ENSG00000043591
ADRB2	ENSG00000169252
ADRB3	ENSG00000188778
ANKRD1	ENSG00000148677
BAG3	ENSG00000151929
CACNA1C	ENSG00000151067

<b>CACNB2</b>	ENSG00000165995
<b>CALR3</b>	ENSG00000269058
<b>CASQ2</b>	ENSG00000118729
<b>CAV3</b>	ENSG00000182533
<b>CBFB</b>	ENSG00000067955
<b>CRYAB</b>	ENSG00000109846
<b>CSRP3</b>	ENSG00000129170
<b>CTF1</b>	ENSG00000150281
<b>DES</b>	ENSG00000175084
<b>DMD</b>	ENSG00000198947
<b>DSC2</b>	ENSG00000134755
<b>DSG2</b>	ENSG00000046604
<b>DSP</b>	ENSG00000096696
<b>EYA4</b>	ENSG00000112319
<b>GPD1L</b>	ENSG00000152642
<b>ILK</b>	ENSG00000166333
<b>JPH2</b>	ENSG00000149596
<b>JUNB</b>	ENSG00000171223
<b>JUP</b>	ENSG00000173801
<b>KCNE1</b>	ENSG00000180509
<b>KCNE2</b>	ENSG00000159197
<b>KCNH2</b>	ENSG00000055118
<b>KCNJ2</b>	ENSG00000123700
<b>KCNJ8</b>	ENSG00000121361
<b>KCNQ1</b>	ENSG00000053918
<b>KCNQ2</b>	ENSG00000075043
<b>LAMP2</b>	ENSG00000005893
<b>LDB3</b>	ENSG00000122367
<b>LIMS1</b>	ENSG00000169756

<b>LIMS2</b>	ENSG00000072163
<b>LMNA</b>	ENSG00000160789
<b>MYBPC3</b>	ENSG00000134571
<b>MYH6</b>	ENSG00000197616
<b>MYH7</b>	ENSG00000092054
<b>MYL2</b>	ENSG00000111245
<b>MYL3</b>	ENSG00000160808
<b>MYOZ2</b>	ENSG00000172399
<b>MYPN</b>	ENSG00000138347
<b>NEXN</b>	ENSG00000162614
<b>PARVB</b>	ENSG00000188677
<b>PDLIM3</b>	ENSG00000154553
<b>PKP2</b>	ENSG00000057294
<b>PLN</b>	ENSG00000198523
<b>PRKAG2</b>	ENSG00000106617
<b>PSEN1</b>	ENSG00000080815
<b>PSEN2</b>	ENSG00000143801
<b>RBFOX1</b>	ENSG00000078328
<b>RBM20</b>	ENSG00000203867
<b>RYR2</b>	ENSG00000198626
<b>SCN1B</b>	ENSG00000105711
<b>SCN4B</b>	ENSG00000177098
<b>SCN5A</b>	ENSG00000183873
<b>SGCD</b>	ENSG00000170624
<b>SMYD1</b>	ENSG00000115593
<b>SMYD2</b>	ENSG00000143499
<b>SNTA1</b>	ENSG00000101400
<b>TAZ</b>	ENSG00000102125
<b>TBX20</b>	ENSG00000164532

<b>TCAP</b>	ENSG00000173991
<b>TGFB3</b>	ENSG00000119699
<b>TMPO</b>	ENSG00000120802
<b>TNNC1</b>	ENSG00000114854
<b>TNNI3</b>	ENSG00000129991
<b>TNNT2</b>	ENSG00000118194
<b>TPM1</b>	ENSG00000140416
<b>TTN</b>	ENSG00000155657
<b>VCL</b>	ENSG00000035403