Supplementary Table 1. Morphometry, echocardiography and hemodynamics in 3 month old male WT and *Pcyt2+/-* mice.

	3 month WT Male	**3 month *Pcyt2+/-* Male**
N- value	6	6
BW(g)	29.53±0.57	27.83±1.14
HW(mg)	140.33±4.48	139.25±2.72
HW:BW	4.76±0.20	4.91±0.16
HW:TL	7.78±0.30	8.63±0.57
HR (bpm)	507.57±5.93	531.46±6.77
LVIDd (mm)	4.02±0.03	4.10±0.11
LVIDs (mm)	2.35±0.02	2.45±0.12
FS (%)	41.51±0.60	40.40±1.67
EF (%)	78.61±0.62	77.20±1.84
LVESP (mmHg)	101.21±52	100.24±0.67
LVEDP (mmHg)	0.31±0.95	-0.87±0.88
LDP (mmHg)	100.89±0.99	102.61±1.09
SBP (mmHg)	97.98±2.09	101.41±0.46
DBP (mmHg)	58.87±6.19	62.94±2.00
MAP (mmHg)	71.66±4.76	75.15±1.30
dp/dt max (mmHg/s)	8715.32±344	9202.43±970
dp/dt min (mmHg/s)	7570.43±811	8543.59±1031

$p>0.05$, no significant difference for all values.

Supplementary Table 2

Compound (mg/L)	Pcyt2$^{+/+}$ ± SD		Pcyt2$^{+/-}$ ± SD		p value$^{\#}$
Phosphorus	2.362	±0.2283	3.013	± 0.245	**0.028**
CO2	22.33	±0.5774	22.67	± 0.5774	0.5185
Total Protein	57.67	± 0.5774	57.67	± 0.5774	1
Albumin	40.33	± 0.5774	38	± 1	**0.0249**
Globulin	17.33	± 0.5774	19.67	± 1.155	**0.0352**
Albumin:Globulin	2.327	± 0.09713	1.94	± 0.1587	**0.0228**
Urea	6.4	± 0.5292	6.833	± 0.7506	0.4596
Creatinine	10.33	± 0.5774	9.667	± 2.082	0.6213
Cholesterol	5.583	± 0.194	6.517	± 0.588	0.0594
Conjugated billirubin	0.6667	± 0.5774	0.6667	± 0.5774	1
Free billirubin	0.3333	± 0.5774	0.3333	± 0.5774	1
AST	181.7	± 38.55	179	± 38.2	0.5045
ALT	125.7	± 36	144.3	± 25.54	0.9363
CK	154.7	± 48.18	142.7	± 72.7	0.8234

Significant differences at $p<0.05$ are shown in bold

Supplementary Table 3: Primers used for gene expression analysis

Pcyt2 WT forward primer	CCTGGAACTCATGAGATCCTTCTG
Pcyt2 WT reverse primer	ATCGCACCACACCCGCACGA
Pcyt2 KO reverse primer	TGCGAGGCCAGAGGCCACTTGTGTAGC
Myh6 forward primer	GATTGGTCTCCCAGCCTCTG
Myh6 reverse primer	TCTTGTCGAACTTGGGTGGG
Acta 1 forward primer	CTAGACACCATGTGCGACGA
Acta 1 reverse primer	TCCCAGTTGGTGATGATGCC
Nppa forward primer	TCCTCGTCTTGGCCTTTTGG
Nppa reverse primer	CAATCCTACCCCCGAAGCAG
Myh7 forward primer	TCCTGCTGTTTCCTTACTTGC
Myh7 reverse primer	GGTAAGCCCAGGCCTGTAGA
Hsl forward primer	ACGCTACACAAAGGCTGCTT
Hsl reverse primer	TCGTTGCGTTTGTAGTGCTC
Atgl forward primer	CAACGCCACTCACATCTACGG
Atgl reverse primer	GGACACCTCAATAATGTTGGCAC
Lpl forward primer	GCTCGCACGAGCGCTCCATT
Lpl reverse primer	CCTCGGGCAGGGTGAAGGGAA
Ppar α forward primer	GCTCACAGAATTTGCCAAGG
Ppar α reverse primer	GTCATCCAGTTCTAAGGCATTG
Gpr30 forward primer	GATCGTTAGATTAACAGAGCAG
Gpr30 reverse primer	CCTGGGAGCCTGTTAGTCTCAG
Mct1 forward primer	GTGCAGCAGCCAAGGAGCCC
Mct1 reverse primer	CCATGGCCAGTCCGTTGGCC
Ace forward primer	CAGGAACGTGGAACTTGGA
Ace reverse primer	CTTTGACGGAAGCATCACC
Gapdh forward primer	ACCACAGTCCATGCCATCAC
Gapdh forward primer	TCCACCACCCTGTTGCTGTA

Supplementary Table 4. Primer table for RAS genes for RTPCR.

Gene	RefSeq ID		Primer sequence (5' to 3')	Product (bp)
Angiotensin converting enzyme (Ace)	NM_207624, NM_001281819, NM_009598	Forward	TATGCCCCTGGAACCTGAT	106
		Reverse	GATGGCTCTCCCCACCTT	
Angiotensinogen (Agt)	NM_007428	Forward	CACCCCTGCTACAGTCCATTG	221
		Reverse	GTCTGTACTGACCCCCTCCAG	
Angiotensin II Type 1 Receptor (Agt1r)	NM_177322	Forward	GGAAACAGCTTGGTGGTGATC	236
		Reverse	CTGAGACACGTGAGCAGGAAC	
Renin (Ren)	NM_031192	Forward	CCTTGACCAATCTTACCTCCC	74
		Reverse	GATGCCAATCTCGCCGTAG	
Angiotensin converting enzyme 2 (Ace2)	NM_027286, NM_001130513	Forward	CAACCCAAAGAACCCACAAG	148
		Reverse	CTCTTCATACAACGGCCTCAG	
Histone (His)	NM_008210	Forward	GCAAGAGTGCGCCCTCTACTG	218
		Reverse	GGCCTCACTTGCCTCCTGCAA	

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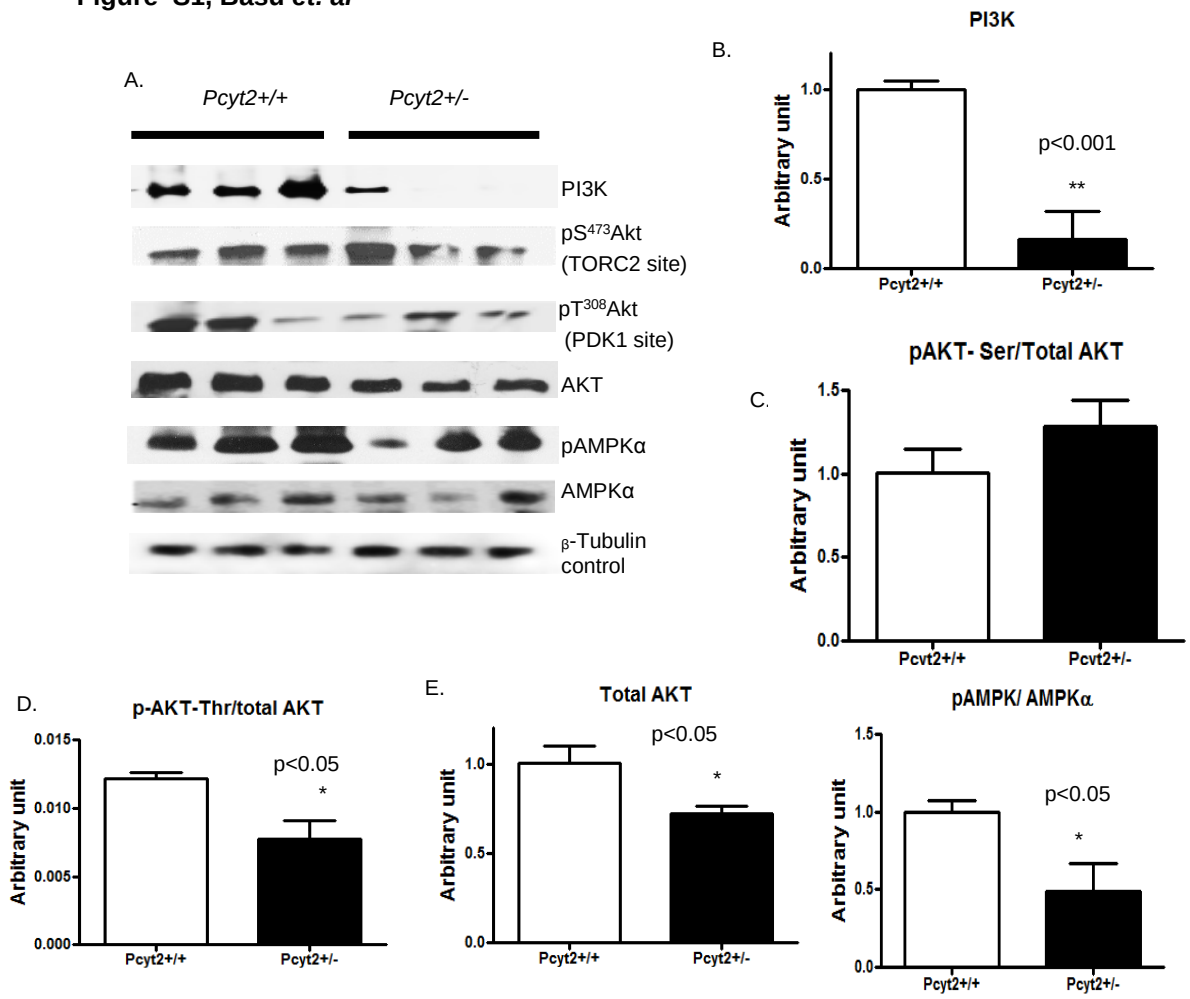

Figure S1: ***The heart insulin signalling pathway of young Pcyt2$^{+/-}$ mice.*** A. Immunoblots for PI3K, Akt, pS^{473}Akt, pT^{308}Akt, AMPK and p-AMPK in *Pcyt2$^{+/-}$* and control littermate heart (n=3 in each group). B. PI3K exhibit dramatic reduction in *Pcyt2$^{+/-}$* heart in comparison to control heart (n=6 per group); C. The ratio of ,pS^{473}Aktr/tAkt was not changed between the groups. D. pT^{308}Akt/tAkt was significantly reduced in *Pcyt2$^{+/-}$* heart E. The total AKT was significantly reduced in Pcyt2+/- heart. F. pAMPK/AMPK ratio was also significantly reduced in *Pcyt2$^{+/-}$* animals in comparison to the littermate control heart. Two-tailed or one tailed Student t-tests were performed and values are mean ±SEM.