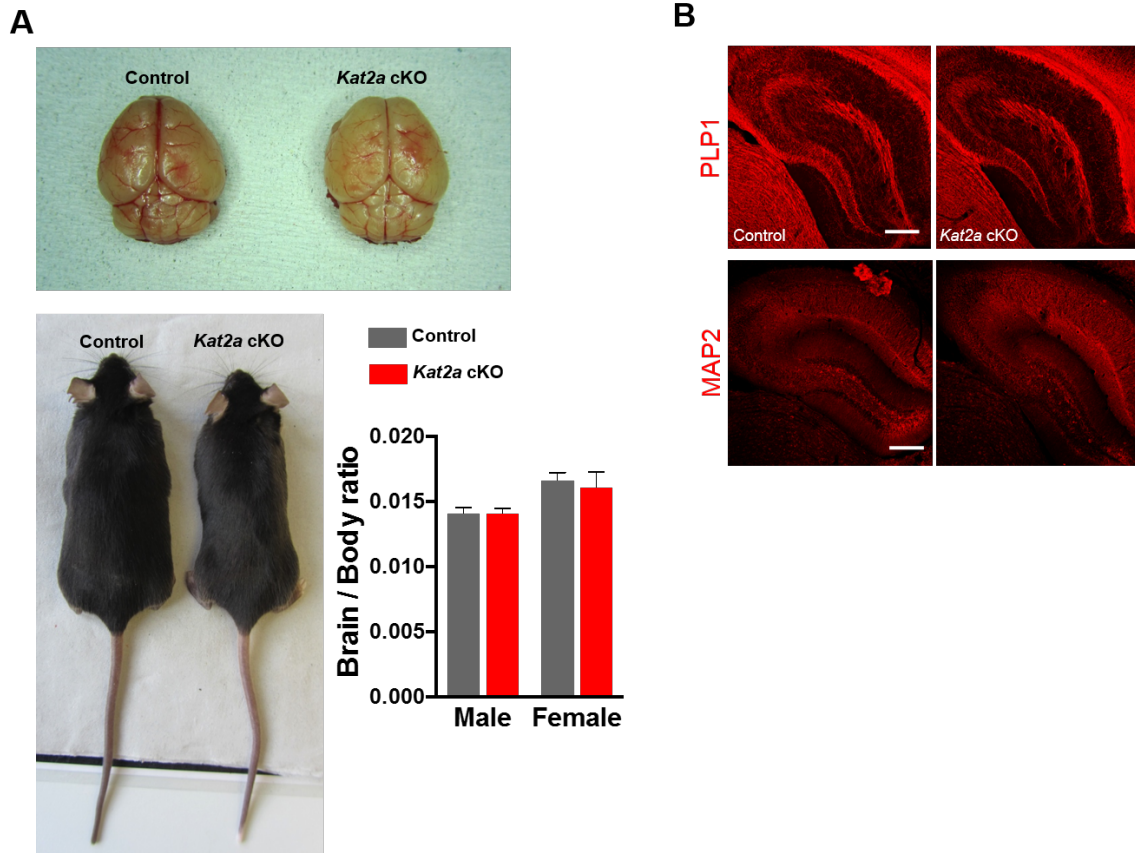


# Supplemental Information

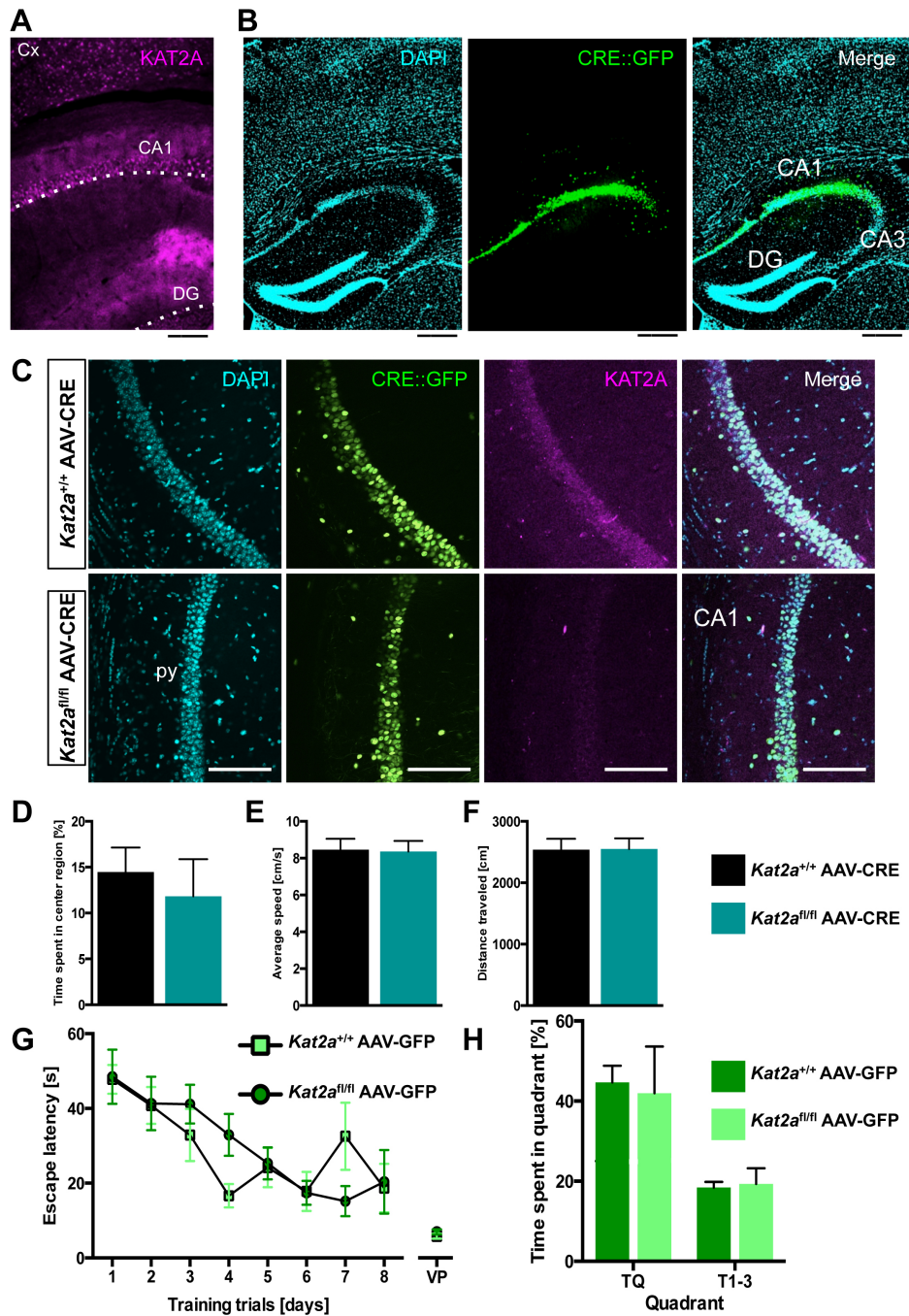
## Supplemental Figures

### Figure S1



**Figure S1. Loss of KAT2A does not alter gross brain morphology.** **A.** *Upper panel:* Representative images of non-fixed brains (olfactory bulbs removed) of male control and *Kat2a* cKO mice. *Lower left panel:* Representative images of male mice from both groups. *Lower right panel:* Quantification of brain weight over body weight ratio. There was no difference between control (n=21) and *Kat2a* cKO (n=16) animals. In both groups, males (n=14 vs. 12) showed lower ratios compared to females (n=7 vs. 4). **B.** Representative images showing hippocampal immunoreactivity for oligodendrocyte marker PLP1 and post-synaptic marker MAP2 in control and *Kat2a* cKO mice (n=4/group) Scale bar:150  $\mu$ m. Error bar represent S.E.M.

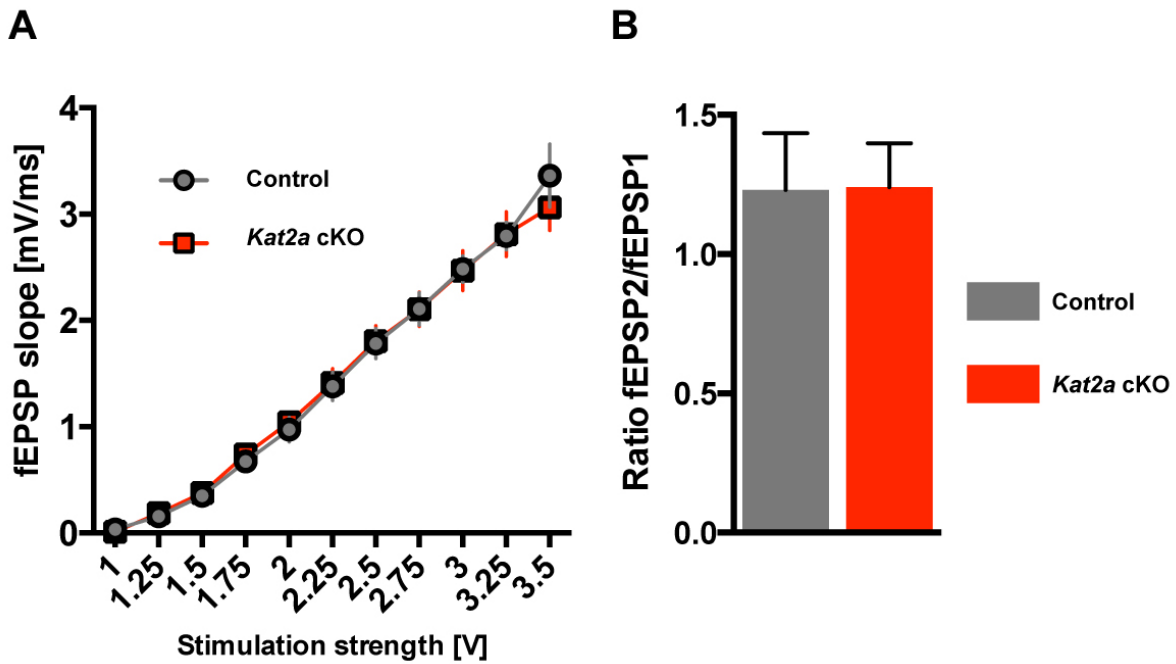
Figure S2



**Fig. S2. KAT2A in the CA1 region does not affect basal anxiety, motor function and short-term plasticity.**

**A.** Representative immunostaining showing KAT2A expression in the cortex (Cx) as well as in CA1 and DG. Scale bar 150  $\mu$ m. **B.** Representative micrographs showing expression of Cre::GFP fusion protein after AAV injection. Detectable expression was limited to CA1. Scale bar: 250  $\mu$ m. **C.** Representative immunostainings showing the reduction of KAT2A in the hippocampal CA1 pyramidal (py) layer of *Kat2a<sup>fl/fl</sup>* AAV-CRE mice compared to wild type controls (*Kat2a<sup>+/+</sup>* AAV-CRE). Scale bar: 250  $\mu$ m. **D-F.** Open field test for *Kat2a<sup>fl/fl</sup>* AAV-CRE mice compared to controls. No differences were found for the tested parameters 'Time spent in center region' (**D**), 'Average speed' (**E**), and 'Distance traveled' (**F**). **G-H.** AAV-GFP was injected in the CA1 of *Kat2a<sup>fl/fl</sup>* and wild type controls (*Kat2a<sup>+/+</sup>*) and mice were subjected to the Morris water maze (n=5/group). There was neither a difference during the acquisition phase (**G**), nor during probe test (**H**). VP: visual platform.

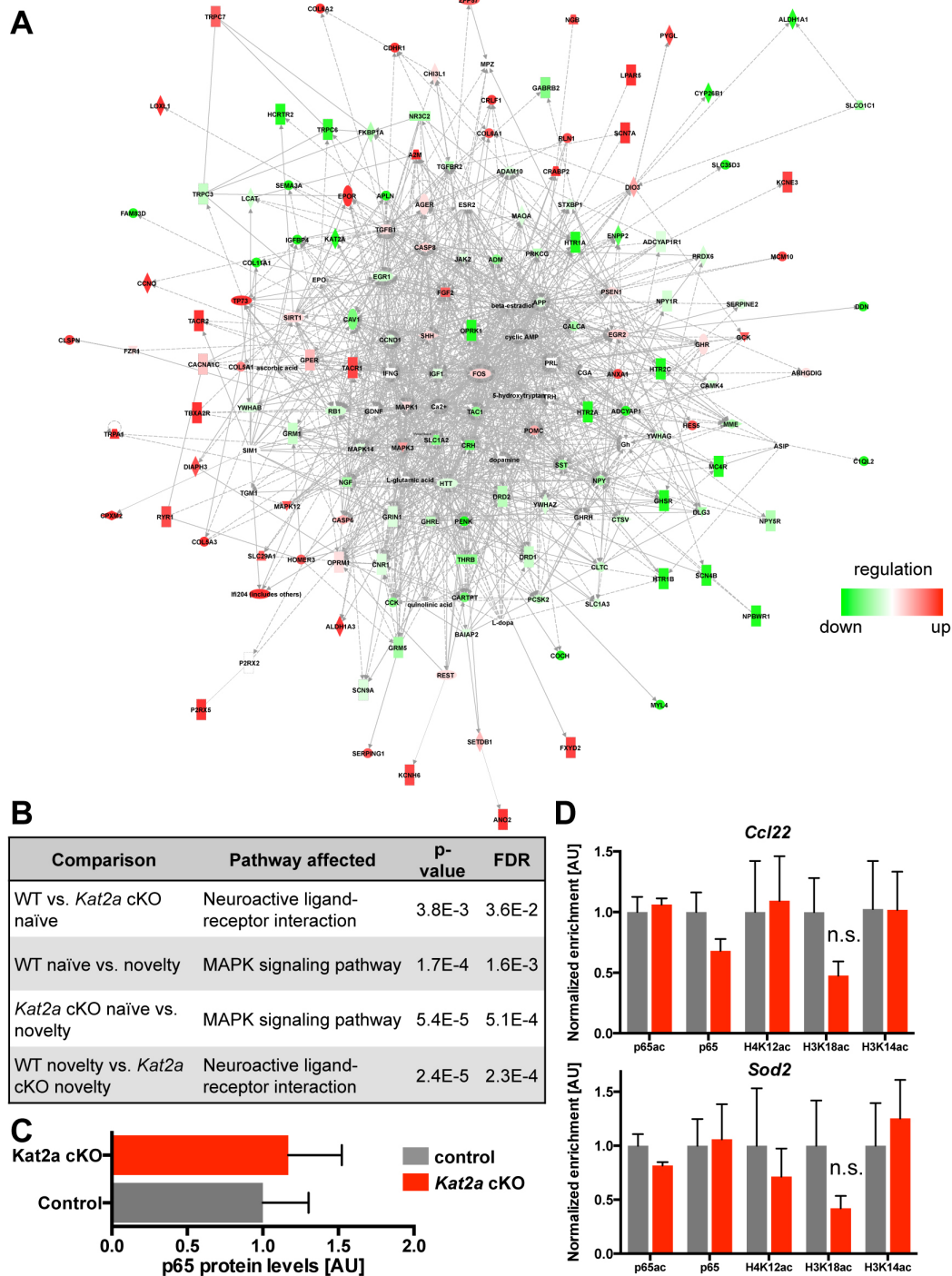
Figure S3



**Fig. S3. CA1 specific plasticity controlled by KAT2A.**

A. To establish input-output relationships for hippocampal CA3-CA1 synapses the slopes of fEPSPs were plotted against the stimulation protocol. Basal synaptic transmission was normal in *Kat2a* cKO and control mice (n= 5/group). B. Paired pulse facilitation tested in *Kat2a* cKO and control mice (n=5/group). The ratios of second over first fEPSP slopes were plotted. There was no significant difference among groups. Error bar represent S.E.M.

Figure S4



**Fig. S4. CA1 specific gene-expression network controlled by KAT2A.**

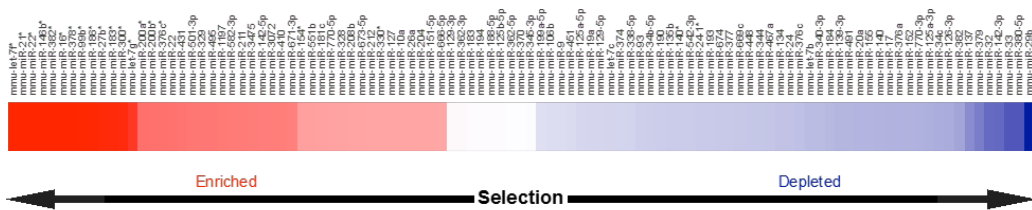
**A.** Network analysis of differentially regulated genes between control and *Kat2a* cKO mice in the CA1 region. For network analysis we used all genes differentially expresses amongst *Kat2a* cKO and control mice under naïve or novelty induced conditions. **B.** Major pathways affected by KAT2A. Please note that the major pathway affected by novelty was MAPK signaling, which was independent of KAT2A function. **C.** Relative protein levels as determined by western blot for p65 (n=4/group). There was no difference between groups. **D.** ChIP at promoters known NF- $\kappa$ B-target genes (*Ccl22* and *Sod2*), which were not regulated in *Kat2a* cKO mice. Primers were designed to amplify the predicted NF- $\kappa$ B binding site. There was no significant difference between groups.

Figure S5

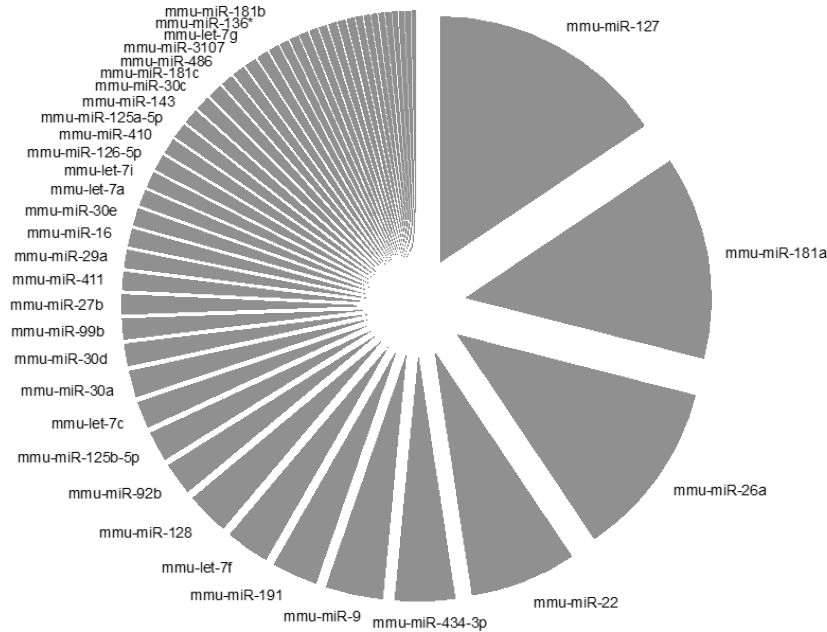
A

Normalized sequence count ratio  
CA1 vs. Hippocampus

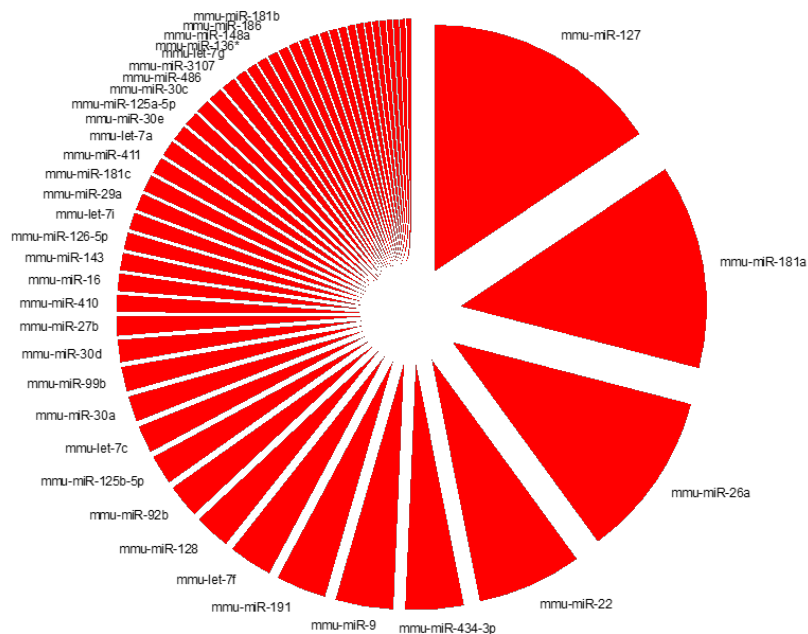
+8 log<sub>2</sub> scale -8



B

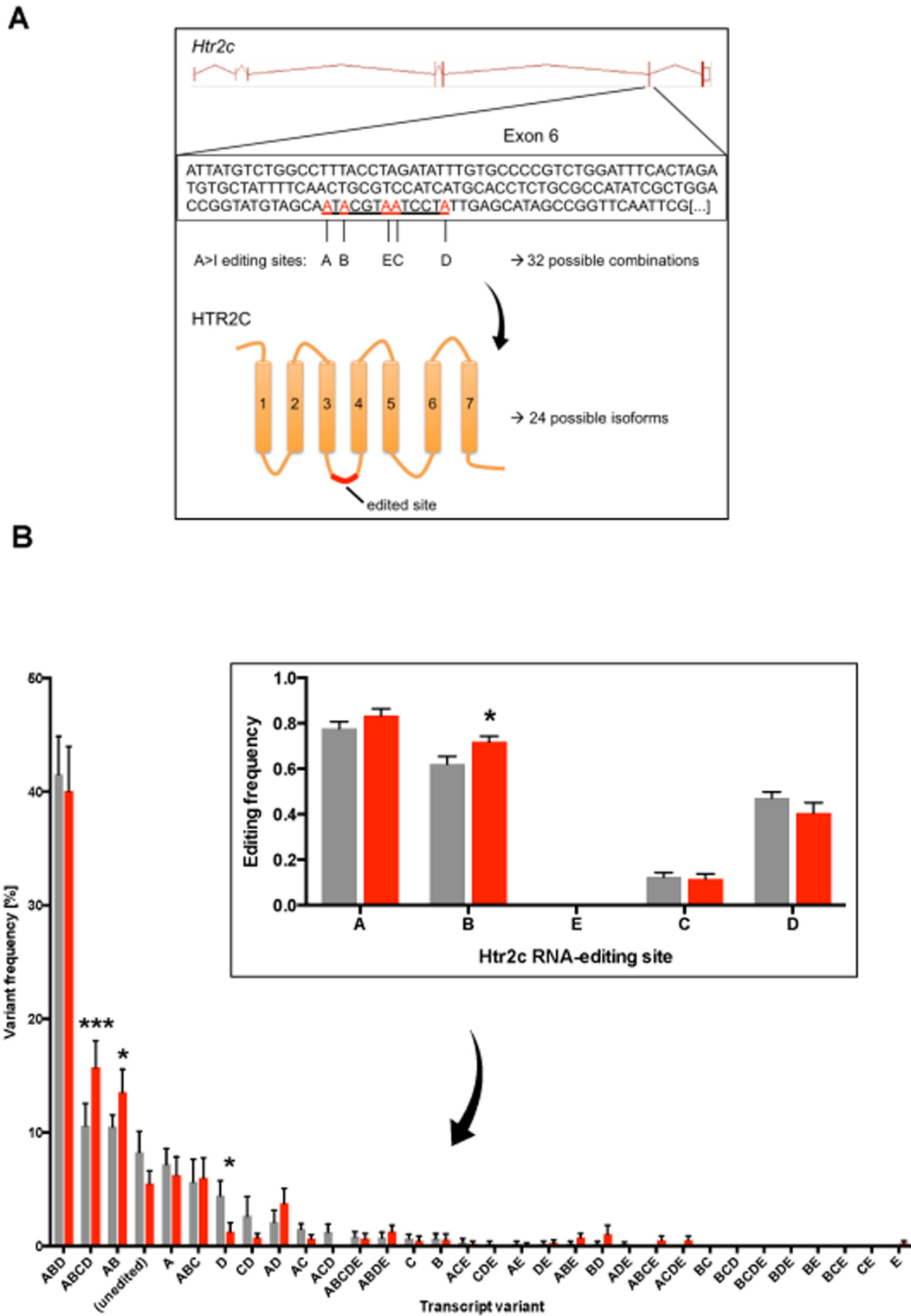


C



**Figure S5. KAT2A does not regulate the CA1 microRNAome.** **A.** Comparison of the miRNome of the whole hippocampus with the CA1-specific miRNome reported in this paper. **B-C.** Comparison of microRNA expression levels did not reveal any significant differences. Average distribution of normalized read counts of the Top50 microRNAs was similar between control (**C**) and *Kat2a* cKO (**C**) mice (n=6/group). For the full list and Top50 comparison see Table\_S5.

Fig S6.



**Fig. S6. Htr2c mRNA-editing is altered in *Kat2a* cKO mice**

It is likely, that multiple KAT2a-dependent processes contribute to a phenotype that is a complex as memory formation. To address this issue – at least in part – we asked if *Kat2a* may be involved in other types of post-transcriptional or co-transcriptional modifications. In addition to the analysis of the transcriptome and the microRNAome we were able to employ our dataset to investigate RNA-editing at known sites.

**A.** The serotonin receptor HTR2C is known to be subject to well defined RNA-editing, a process in which adenosine bases in the transcribed mRNA are deaminated to inosine bases (A>I

modification) (Burns et al, 1997). As editing is occurring in the protein coding region (exon 6) of the *Htr2c* mRNA it leads to altered protein function (Burns et al, 1997). The image shows an overview of the mRNA-editing processing and edited sites in the *Htr2c* mRNA.

**B.** Using our RNA-seq dataset, we thus investigated the known modification to see whether RNA-editing of *Htr2c* mRNA is altered by loss of *Kat2a*. Using as similar read coverage over the exon 6 for *Kat2a* cKO and control mice we found a significant increase in editing frequency at the B site of the editing cassette that was due to an increase in the relative abundance of the ABCD-edited and AB-edited variants, which were the second- and third-most expressed variants in the CA1 (**Table S6**), and a decrease in the variant edited at the D site. This translates to an increase in the VSV- and VNI-protein isoforms and a decrease in the INV-protein isoform. Notably, an the increased VNI- as well as the VSV-protein isoforms have been associated with decreased function of the HTR2C receptor, since the edited protein region is involved in G-Protein-coupling (Berg et al, 2008; Burns et al, 1997; Schellekens et al, 2012). Together with decreased overall expression of the *Htr2c* gene, this leads to further reduced HTR2C signaling in the CA1 region. In summary panel B shows that A>I editing at site B was significantly altered, which was due to increase of the ABCD- and AB-transcript variants and decrease in the D-transcript variant (n=11-13/group, Holm-Sidak-corrected multiple, two-sided t-tests, \*\*\* $p < 0.001$ , \* $p < 0.05$ ). Error bars represent S.E.M.

Discussion of the presented data: We were able to employ our dataset to investigate RNA-editing at known sites and found, that the *Htr2c* mRNA was edited to increase variant frequencies that are associated with compromised protein function. Since mRNA editing is occurring co-transcriptionally and before splicing (Bentley, 2014), we therefore speculate that loss of *Kat2a* and therefore decreased histone acetylation during transcription may lead to a decreased RNA-polIII-dependent transcription rate, which leaves the editing enzymes (ADAR) with more time to carry out the necessary chemical reactions (Bentley, 2014) (Rodriguez et al, 2012).

**Bentley DL (2014) Coupling mRNA processing with transcription in time and space. *Nat Rev Genet* 15: 163-175**

**Berg KA, Clarke WP, Cunningham KA, Spampinato U (2008) Fine-tuning serotonin2c receptor function in the brain: molecular and functional implications. *Neuropharmacology* 55: 969-976**

**Burns CM, Chu H, Rueter SM, Hutchinson LK, Canton H, Sanders-Bush E, Emeson RB (1997) Regulation of serotonin-2C receptor G-protein coupling by RNA editing. *Nature* 387: 303-308**

**Rodriguez J, Menet JS, Rosbash M (2012) Nascent-seq indicates widespread cotranscriptional RNA editing in *Drosophila*. *Mol Cell* 47: 27-37**

**Schellekens H, Clarke G, Jeffery IB, Dinan TG, Cryan JF (2012) Dynamic 5-HT2C receptor editing in a mouse model of obesity. *PLoS One* 7: e32266**

**Table S1. Genes expressed in hippocampal CA1 region****A. TOP50 genes expressed in CA1**

<b>Ensembl Gene ID</b>	<b>MGI Symbol</b>
ENSMUSG00000024617	Camk2a
ENSMUSG00000074657	Kif5a
ENSMUSG00000005089	Slc1a2
ENSMUSG00000001175	Calm1
ENSMUSG00000037852	Cpe
ENSMUSG00000027273	Snap25
ENSMUSG00000028161	Ppp3ca
ENSMUSG00000026576	Atp1b1
ENSMUSG00000029309	Sparcl1
ENSMUSG00000040907	Atp1a3
ENSMUSG00000021268	Meg3
ENSMUSG00000036438	Calm2
ENSMUSG00000098178	RP23-81C12.3
ENSMUSG00000041607	Mbp
ENSMUSG00000031517	Gpm6a
ENSMUSG00000037742	Eef1a1
ENSMUSG00000035864	Syt1
ENSMUSG00000022892	App
ENSMUSG00000023944	Hsp90ab1
ENSMUSG00000028833	Ncdn
ENSMUSG00000059213	Ddn
ENSMUSG00000031425	Plp1
ENSMUSG00000025867	Cplx2
ENSMUSG00000036564	Ndr4
ENSMUSG00000004207	Psap
ENSMUSG00000030695	Aldoa
ENSMUSG00000015222	Map2
ENSMUSG00000051853	Arf3
ENSMUSG00000019943	Atp2b1
ENSMUSG00000019370	Calm3
ENSMUSG00000025203	Scd2
ENSMUSG00000057738	Sptan1
ENSMUSG00000024661	Fth1
ENSMUSG00000027254	Map1a
ENSMUSG00000014602	Kif1a
ENSMUSG00000044349	Snhg11
ENSMUSG00000024758	Rtn3
ENSMUSG00000032294	Pkm
ENSMUSG00000040785	Ttc3
ENSMUSG00000019877	Serinc1
ENSMUSG00000020431	Adcy1
ENSMUSG00000033981	Gria2
ENSMUSG00000046093	Hpcal4
ENSMUSG00000020524	Gria1
ENSMUSG00000025393	Atp5b



ENSMUSG00000026473 Glul  
 ENSMUSG00000056486 Chn1  
 ENSMUSG00000031342 Gpm6b  
 ENSMUSG00000079037 Prnp  
 ENSMUSG00000034187 Nsf

## B. Pathway analysis of TOP 50 genes

### Functional annotation of Top50 expressed genes in mouse CA1 (from DESeq2 output)

red: terms associated with neuronal function  
 \*\*\*:FDR<0.001; \*\*:FDR<0.01; \*:FDR<0.05; #:FDR<0.1

KEGG-Pathway Term	Fold Enrichment	PValue	FDR	Significant?
mmu04720:Long-term potentiation	21.4	4.9E-06	4.7E-05	***
mmu05014:Amyotrophic lateral sclerosis (ALS)	18.3	1.1E-03	1.0E-02	**
mmu04020:Calcium signaling pathway	6.9	4.4E-03	4.1E-02	*
mmu04114:Oocyte meiosis	8.8	8.6E-03	8.0E-02	#
mmu05010:Alzheimer's disease	5.9	2.5E-02	2.1E-01	ns.

GO Term	Fold Enrichment	PValue	FDR	Significant?
GO:0007268~synaptic transmission	11.1	1.4E-07	1.87E-06	***
GO:0006164~purine nucleotide biosynthetic process	13.5	6.6E-05	9.06E-04	***
GO:0009142~nucleoside triphosphate biosynthetic process	16.3	2.1E-04	2.94E-03	**
GO:0034404~nucleobase, nucleoside and nucleotide biosynthetic process	10.3	2.3E-04	3.15E-03	**
GO:0034654~nucleobase, nucleoside, nucleotide and nucleic acid biosynthetic process	10.3	2.3E-04	3.15E-03	**
GO:0007611~learning or memory	15.0	3.0E-04	4.07E-03	**
GO:0009144~purine nucleoside triphosphate metabolic process	13.6	4.3E-04	5.83E-03	**
GO:0009260~ribonucleotide biosynthetic process	13.4	4.5E-04	6.20E-03	**
GO:0007616~long-term memory	83.1	5.4E-04	7.40E-03	**
GO:0009150~purine ribonucleotide metabolic process	12.0	6.8E-04	9.27E-03	**
GO:0055082~cellular chemical homeostasis	6.1	7.4E-04	1.02E-02	*
GO:0006812~cation transport	4.8	9.6E-04	1.31E-02	*
GO:0050801~ion homeostasis	5.7	1.1E-03	1.49E-02	*
GO:0006753~nucleoside phosphate metabolic process	6.8	1.5E-03	2.08E-02	*
GO:0030001~metal ion transport	5.0	2.1E-03	2.85E-02	*
GO:0007632~visual behavior	32.1	3.7E-03	4.93E-02	*
GO:0043242~negative regulation of protein complex disassembly	24.3	6.4E-03	8.40E-02	#
GO:0050804~regulation of synaptic transmission	9.8	7.2E-03	9.50E-02	#

**Table S2: Differential expressed genes amongst KAT2A cKO and control mice in the CA1 region**

<u>Up(WT naive vs. novelty)</u>		<u>Down(WT naive vs. novelty)</u>	
<u>MGI Symbol</u>	<u>ENSEMBL-ID</u>	<u>MGI Symbol</u>	<u>ENSEMBL-ID</u>
Egr2	ENSMUSG00000037868	AB041806	ENSMUSG00000046109
Fos	ENSMUSG00000021250	Aim1	ENSMUSG00000019866
Fosb	ENSMUSG00000003545	Egf	ENSMUSG00000028017
Egr1	ENSMUSG00000038418	Gm12908	ENSMUSG000000087200
Egr4	ENSMUSG000000071341	Dcaf12l2	ENSMUSG000000050926
1700016P03Rik	ENSMUSG000000085609	Tlr9	ENSMUSG000000045322
Maff	ENSMUSG000000042622	Tmem194b	ENSMUSG000000043015
Fam83d	ENSMUSG000000027654	Samsn1	ENSMUSG000000022876
Nr4a1	ENSMUSG000000023034	Gm5577	ENSMUSG000000084950
Homer1	ENSMUSG000000007617	A2m	ENSMUSG000000030111
Arc	ENSMUSG000000022602	Adrb3	ENSMUSG000000031489
Dusp5	ENSMUSG000000034765	Klhdc9	ENSMUSG000000045259
Sik1	ENSMUSG000000024042	BC024139	ENSMUSG000000044361
Arl4d	ENSMUSG000000034936	Edn1	ENSMUSG000000021367
Plekhf1	ENSMUSG000000074170	Micall2	ENSMUSG000000036718
Nr4a3	ENSMUSG000000028341	Tnfsf10	ENSMUSG000000039304
Sgk1	ENSMUSG000000019970	Apobec1	ENSMUSG000000040613
Per1	ENSMUSG000000020893	Hhex	ENSMUSG000000024986
Egr3	ENSMUSG000000033730	Ccno	ENSMUSG000000042417
Nostrin	ENSMUSG000000034738	Gprc5c	ENSMUSG000000051043
Fas	ENSMUSG000000024778	Heyl	ENSMUSG000000032744
Cdkn1a	ENSMUSG000000023067	RP23-285C18.2	ENSMUSG000000097415
Tsc22d3	ENSMUSG000000031431	Rassf9	ENSMUSG000000044921
Dio2	ENSMUSG000000007682	Pabpc4l	ENSMUSG000000090919
Arid5a	ENSMUSG000000037447	Pcdhb1	ENSMUSG000000051663
Junb	ENSMUSG000000052837	Gm11948	ENSMUSG000000087055
Fam46a	ENSMUSG000000032265	Irs4	ENSMUSG000000054667
Ppp1r3g	ENSMUSG000000050423	Fam181a	ENSMUSG000000096753
Errfi1	ENSMUSG000000028967	Cd180	ENSMUSG000000021624
Klf2	ENSMUSG000000055148	Gm20692	ENSMUSG000000093739
Mc4r	ENSMUSG000000047259	G530011O06Rik	ENSMUSG000000072844
Nr4a2	ENSMUSG000000026826	Klhl6	ENSMUSG000000043008
Fhl3	ENSMUSG000000032643		
Fosl2	ENSMUSG000000029135		
Map3k19	ENSMUSG000000051590		
Rasd1	ENSMUSG000000049892		
Fam150b	ENSMUSG000000054204		
Tiparp	ENSMUSG000000034640		
Xdh	ENSMUSG000000024066		
Gadd45b	ENSMUSG000000015312		
Arl5b	ENSMUSG000000017418		
Sertad1	ENSMUSG000000008384		
Prr5	ENSMUSG000000036106		
Gpr3	ENSMUSG000000049649		
Utp14b	ENSMUSG000000079470		
Zdbf2	ENSMUSG000000027520		
Spsb1	ENSMUSG000000039911		
Dusp6	ENSMUSG000000019960		
Jhdm1d	ENSMUSG000000042599		
Plin4	ENSMUSG000000002831		
Coq10b	ENSMUSG000000025981		
Gpt2	ENSMUSG000000031700		

Tnfrsf12a	ENSMUSG00000023905
Dnajb5	ENSMUSG00000036052
Adipor2	ENSMUSG00000030168
Nptx2	ENSMUSG00000059991
Mettl11b	ENSMUSG00000040113
Per2	ENSMUSG00000055866
Pcsk1	ENSMUSG00000021587
Lingo3	ENSMUSG00000051067
Nfkbia	ENSMUSG00000021025
Mfsd2a	ENSMUSG00000028655
Irs2	ENSMUSG00000038894
Zfp189	ENSMUSG00000039634
Dnajb1	ENSMUSG00000005483
Smim3	ENSMUSG00000038059
Midn	ENSMUSG00000035621
Slc2a1	ENSMUSG00000028645
Klf15	ENSMUSG00000030087
Rrp8	ENSMUSG00000030888
Rasl11b	ENSMUSG00000049907
Ier5	ENSMUSG00000056708
Dusp4	ENSMUSG00000031530
Lrmp	ENSMUSG00000030263
Zfp319	ENSMUSG00000074140

**Up(WT naive vs. *Kat2a* cKO naive)**

<b>MGI Symbol</b>	<b>ENSEMBL-ID</b>
Klk10	ENSMUSG00000030693
Otop2	ENSMUSG00000050201
Cdhr1	ENSMUSG00000021803
Cacng6	ENSMUSG00000078815
Ano2	ENSMUSG00000038115
B3gnt8	ENSMUSG00000059479
Baiap3	ENSMUSG00000047507
Sec14l4	ENSMUSG00000019368
Tbxa2r	ENSMUSG00000034881
Plb1	ENSMUSG00000029134
Adamts18	ENSMUSG00000053399
Pstpip1	ENSMUSG00000032322
Trpa1	ENSMUSG00000032769
Cpxm2	ENSMUSG00000030862
Tgm3	ENSMUSG00000027401
Trp73	ENSMUSG00000029026
Ush1g	ENSMUSG00000045288
P2rx5	ENSMUSG00000005950
Rspo1	ENSMUSG00000028871
Cldn26	ENSMUSG00000022715
Crabp2	ENSMUSG00000004885
Igfbpl1	ENSMUSG00000035551
Loxl1	ENSMUSG00000032334
Zfp296	ENSMUSG00000011267
Epor	ENSMUSG00000006235
Gm9821	ENSMUSG000000095332
Medag	ENSMUSG00000029659
CiCa2	ENSMUSG00000028262
Tjp3	ENSMUSG00000034917
Cd163	ENSMUSG00000008845
Jsrp1	ENSMUSG00000020216

**Down(WT naive vs. *Kat2a* cKO naive)**

<b>MGI Symbol</b>	<b>ENSEMBL-ID</b>
Pcdhb4	ENSMUSG00000045689
Akr1c14	ENSMUSG00000033715
Htr2c	ENSMUSG00000041380
Col11a1	ENSMUSG00000027966
Hcrtr2	ENSMUSG00000032360
Gm12198	ENSMUSG00000085564
A530058N18Rik	ENSMUSG00000087694
5430416O09Rik	ENSMUSG00000028475
Spink10	ENSMUSG00000044176
Irak3	ENSMUSG00000020227
Zfp934	ENSMUSG00000074865
Npbwr1	ENSMUSG00000033774
Ghsr	ENSMUSG00000051136
<i>Atp4a</i>	<i>ENSMUSG00000005553</i>
Gm5815	ENSMUSG00000046952
G530011O06Rik	ENSMUSG00000072844
2310042E22Rik	ENSMUSG00000090356
Cyp26b1	ENSMUSG00000063415
AC140785.1	ENSMUSG00000097869
Adcyap1	ENSMUSG00000024256
Penk	ENSMUSG00000045573
2410018L13Rik	ENSMUSG00000073164
<b>Kat2a</b>	<b>ENSMUSG00000020918</b>
Grem1	ENSMUSG00000074934
Oxr1	ENSMUSG00000022307

RP23-42D10.1	ENSMUSG00000098072
Gm4737	ENSMUSG00000048087
Atp2c2	ENSMUSG00000034112
Itgb7	ENSMUSG00000001281
Crlf1	ENSMUSG00000007888
Smtnl2	ENSMUSG00000045667
Zfp185	ENSMUSG00000031351
Clspn	ENSMUSG00000042489
Kcne3	ENSMUSG00000035165
RP24-158L2.1	ENSMUSG00000098097
Pgpep1l	ENSMUSG00000030553
Ucma	ENSMUSG00000026668
Vwa3a	ENSMUSG00000030889
Epn3	ENSMUSG00000010080
Adamts13	ENSMUSG00000014852
Rhcg	ENSMUSG00000030549
Gm15860	ENSMUSG00000087336
A630023P12Rik	ENSMUSG00000048215
Ccdc129	ENSMUSG00000037973
Sypl2	ENSMUSG00000027887
Diap3	ENSMUSG00000022021
Myo1h	ENSMUSG00000066952
Rreb1	ENSMUSG00000039087
Otogl	ENSMUSG00000091455
RP24-413G2.4	ENSMUSG00000098128
Myh3	ENSMUSG00000020908
Col22a1	ENSMUSG00000079022
Igdcc3	ENSMUSG00000032394
Mapk12	ENSMUSG00000022610
Dkk1	ENSMUSG00000030792
Serping1	ENSMUSG00000023224
Slc29a1	ENSMUSG00000023942
Ttc22	ENSMUSG00000034919
Ppl	ENSMUSG00000039457
Gck	ENSMUSG00000041798
Hbb-b1	ENSMUSG00000052305
Slc26a8	ENSMUSG00000036196
Fam160a1	ENSMUSG00000051000
Blnk	ENSMUSG00000061132
Spint1	ENSMUSG00000027315

**Up(WT novelty vs. *Kat2a* cKO novelty)**

<b>MGI Symbol</b>	<b>ENSEMBL-ID</b>
Tbxa2r	ENSMUSG00000034881
Baiap3	ENSMUSG00000047507
Capn11	ENSMUSG00000058626
Cldn26	ENSMUSG00000022715
Trp73	ENSMUSG00000029026
RP23-42D10.1	ENSMUSG00000098072
Tacr2	ENSMUSG00000020081
Ush1g	ENSMUSG00000045288
Cdhr1	ENSMUSG00000021803
Spn	ENSMUSG00000051457
B3gnt8	ENSMUSG00000059479
Itgb7	ENSMUSG00000001281
Col6a5	ENSMUSG00000091345
BC024139	ENSMUSG00000044361

**Down(WT novelty vs. *Kat2a* cKO novelty)**

<b>MGI Symbol</b>	<b>ENSEMBL-ID</b>
Eva1c	ENSMUSG00000039903
AC129605.1	ENSMUSG00000097789
Plekhg1	ENSMUSG00000040624
Mmrn2	ENSMUSG00000041445
Igfbp4	ENSMUSG00000017493
Gm15710	ENSMUSG00000084111
Gm15631	ENSMUSG00000085067
Ddn	ENSMUSG00000059213
Sema3a	ENSMUSG00000028883
Zfp97	ENSMUSG00000095990
Akr1c14	ENSMUSG00000033715
Rpl9-ps7	ENSMUSG00000047965
Aldh1a1	ENSMUSG00000053279
Oprk1	ENSMUSG00000025905

Klk10	ENSMUSG00000030693	Scn3b	ENSMUSG00000049281
Cacng6	ENSMUSG00000078815	Htr2a	ENSMUSG00000034997
AC145610.1	ENSMUSG00000097593	Htr1a	ENSMUSG00000021721
Col6a2	ENSMUSG00000020241	Akr1c18	ENSMUSG00000021214
Pstpip1	ENSMUSG00000032322	Coch	ENSMUSG00000020953
A2m	ENSMUSG00000030111	Stac	ENSMUSG00000032502
Otof	ENSMUSG00000062372	Rpl9-ps4	ENSMUSG00000094989
Cd109	ENSMUSG00000046186	Gm3667	ENSMUSG00000090691
Gm15422	ENSMUSG00000082738	Myl4	ENSMUSG00000061086
Plb1	ENSMUSG00000029134	Gm10012	ENSMUSG00000057580
Ucma	ENSMUSG00000026668	Scn4b	ENSMUSG00000046480
Ano2	ENSMUSG00000038115	Fam19a1	ENSMUSG00000059187
Xpnpep2	ENSMUSG00000037005	Gm10029	ENSMUSG00000068324
Clca1	ENSMUSG00000056025	Unc13c	ENSMUSG00000062151
Spata18	ENSMUSG00000029155	Meox1	ENSMUSG00000001493
Olfm4	ENSMUSG00000022026	AC164597.1	ENSMUSG00000097493
Gm15478	ENSMUSG00000085363	Mc4r	ENSMUSG00000047259
Dnahc11	ENSMUSG00000018581	Apln	ENSMUSG00000037010
RP24-158L2.1	ENSMUSG00000098097	Npbwr1	ENSMUSG00000033774
Mfap4	ENSMUSG00000042436	Htr1b	ENSMUSG00000049511
Epn3	ENSMUSG00000010080	Plekha2	ENSMUSG00000031557
Gm9821	ENSMUSG00000095332	Gm11263	ENSMUSG00000083496
Wdr66	ENSMUSG00000029442	Adcyap1	ENSMUSG00000024256
Epb4.114a	ENSMUSG00000024376	Lefty1	ENSMUSG00000038793
Scn7a	ENSMUSG00000034810	Gm15721	ENSMUSG00000085565
5330416C01Rik	ENSMUSG00000054944	Htra4	ENSMUSG00000037406
Igdcc3	ENSMUSG00000032394	Slc35d3	ENSMUSG00000050473
Thbs3	ENSMUSG00000028047	Gm17732	ENSMUSG00000091744
Llgl2	ENSMUSG00000020782	Fam83d	ENSMUSG00000027654
Gm11721	ENSMUSG00000087064	Gm4613	ENSMUSG00000090467
Scube2	ENSMUSG00000007279	Rps3a3	ENSMUSG00000059751
Hydin	ENSMUSG00000059854	Cyp26b1	ENSMUSG00000063415
Ifi203	ENSMUSG00000039997	Spink10	ENSMUSG00000044176
Ccdc153	ENSMUSG00000070306	Ghsr	ENSMUSG00000051136
Tex15	ENSMUSG00000009628	Ninj2	ENSMUSG00000041377
Ccdc88b	ENSMUSG00000047810	Slitrk6	ENSMUSG00000045871
Ppp2r3d	ENSMUSG00000093803	Cdk15	ENSMUSG00000026023
Cdsn	ENSMUSG00000039518	<b>Kat2a</b>	<b>ENSMUSG00000020918</b>
Myo1h	ENSMUSG00000066952	C1ql2	ENSMUSG00000036907
Pou6f2	ENSMUSG00000009734	Grem1	ENSMUSG00000074934
Ybx2	ENSMUSG00000018554	Penk	ENSMUSG00000045573
Zglp1	ENSMUSG00000079681	Oxr1	ENSMUSG00000022307
1700040L02Rik	ENSMUSG00000019945	2410018L13Rik	ENSMUSG00000073164
Adamts14	ENSMUSG00000059901		
Best3	ENSMUSG00000020169		
Rreb1	ENSMUSG00000039087		
Tjp3	ENSMUSG00000034917		
Col5a3	ENSMUSG00000004098		
Gm4779	ENSMUSG00000045010		
Igfbpl1	ENSMUSG00000035551		
Zfp185	ENSMUSG00000031351		
Lpar5	ENSMUSG00000067714		
Papln	ENSMUSG00000021223		
Ccno	ENSMUSG00000042417		
Bcl2l15	ENSMUSG00000044165		
Lpar2	ENSMUSG00000031861		
Tnni3k	ENSMUSG00000040086		

Iqub	ENSMUSG00000046192
Ccdc162	ENSMUSG00000075225
Loxl1	ENSMUSG00000032334
AC152181.1	ENSMUSG00000097259
Derl3	ENSMUSG00000009092
Aldh1a3	ENSMUSG00000015134
Gm216	ENSMUSG00000073650
Vwa3a	ENSMUSG00000030889
Pgpep1l	ENSMUSG00000030553
Figf	ENSMUSG00000031380
Sec16b	ENSMUSG00000026589
Gm16119	ENSMUSG00000010492
Dnaaf3	ENSMUSG00000055809
Zfp296	ENSMUSG00000011267
Fxyd2	ENSMUSG00000059412
Medag	ENSMUSG00000029659
Gm7120	ENSMUSG00000074634
Catsperg1	ENSMUSG00000049676
Tacr1	ENSMUSG00000030043
1700026D08Rik	ENSMUSG00000011154
Otogl	ENSMUSG00000091455
Gm8261	ENSMUSG00000081718
Anxa1	ENSMUSG00000024659
Hpn	ENSMUSG00000001249
Gm15423	ENSMUSG00000087082
Kcnh6	ENSMUSG00000001901
Slc26a8	ENSMUSG00000036196
Mcm10	ENSMUSG00000026669
Ngb	ENSMUSG00000021032
Adamts13	ENSMUSG00000014852
Fam179a	ENSMUSG00000045761
Sypl2	ENSMUSG00000027887
Ryr1	ENSMUSG00000030592
Pygl	ENSMUSG00000021069
Ppl	ENSMUSG00000039457
6820408C15Rik	ENSMUSG00000032680
Xrra1	ENSMUSG00000035211
RP24-413G2.4	ENSMUSG00000098128
Acy3	ENSMUSG00000024866
Rln1	ENSMUSG00000039097
Ptpn14	ENSMUSG00000026604
Aloxe3	ENSMUSG00000020892
Epor	ENSMUSG00000006235
AC149052.1	ENSMUSG00000097246
Nbeal2	ENSMUSG00000056724
Gm867	ENSMUSG00000050157
Gm5577	ENSMUSG00000084950
Atg9b	ENSMUSG00000038295
Ccdc155	ENSMUSG00000038292
AC122200.1	ENSMUSG00000097133
Sebox	ENSMUSG00000001103
Cpxm2	ENSMUSG00000030862
Hes5	ENSMUSG00000048001
Tmem181c-ps	ENSMUSG00000093880
Ccl28	ENSMUSG00000074715
Unc13d	ENSMUSG00000057948
Serping1	ENSMUSG00000023224

Col6a1	ENSMUSG00000001119
Dnase1l2	ENSMUSG000000024136
Fbxo48	ENSMUSG000000044966
Ankrd53	ENSMUSG000000014747
Fndc9	ENSMUSG000000048721
Gm14137	ENSMUSG000000055926
Gm10658	ENSMUSG000000074284
Fam117a	ENSMUSG000000038893
Crybb3	ENSMUSG000000029352
Crocc	ENSMUSG000000040860
Dock6	ENSMUSG000000032198
Rcor2	ENSMUSG000000024968
Pnck	ENSMUSG000000002012
Mxd3	ENSMUSG000000021485
Ccdc3	ENSMUSG000000026676
Homer3	ENSMUSG000000003573
Tm6sf2	ENSMUSG000000036151
1700016P03Rik	ENSMUSG000000085609
Fam183b	ENSMUSG000000049154
Kif27	ENSMUSG000000060176
Zfp57	ENSMUSG000000036036
Trpc7	ENSMUSG000000021541
Fam167a	ENSMUSG000000035095
Kcp	ENSMUSG000000059022
Strc	ENSMUSG000000033498
Rnf207	ENSMUSG000000058498
Atoh8	ENSMUSG000000037621
Blnk	ENSMUSG000000061132
Scarf2	ENSMUSG000000012017
Magel2	ENSMUSG000000056972
Gm15567	ENSMUSG000000084974
Slc16a11	ENSMUSG000000040938
Tonsl	ENSMUSG000000059323
1700019L03Rik	ENSMUSG000000038987

**Up(Kat2a cKO naive vs. novelty)**

<b>MGI Symbol</b>	<b>ENSEMBL-ID</b>
Egr2	ENSMUSG000000037868
Fosb	ENSMUSG000000003545
Fos	ENSMUSG000000021250
1700016P03Rik	ENSMUSG000000085609
Egr1	ENSMUSG000000038418
Egr4	ENSMUSG000000071341
Mir132	ENSMUSG000000065537
Homer1	ENSMUSG000000007617
Arc	ENSMUSG000000022602
Nr4a1	ENSMUSG000000023034
Sik1	ENSMUSG000000024042
Fosl2	ENSMUSG000000029135
Nr4a3	ENSMUSG000000028341
Fam46a	ENSMUSG000000032265
Dusp5	ENSMUSG000000034765
RP23-204I16.2	ENSMUSG000000098061
Junb	ENSMUSG000000052837
Fam150b	ENSMUSG000000054204
Egr3	ENSMUSG000000033730
Maff	ENSMUSG000000042622

**Down(Kat2a cKO naive vs. novelty)**

<b>MGI Symbol</b>	<b>ENSEMBL-ID</b>
Adamts18	ENSMUSG000000053399
Oacyl	ENSMUSG000000046610
Clec2d	ENSMUSG000000030157
Ehhadh	ENSMUSG000000022853
Gm6970	ENSMUSG000000091230
9930012K11Rik	ENSMUSG000000044551
Nkx3-1	ENSMUSG000000022061
Mamstr	ENSMUSG000000042918
Tnfsf10	ENSMUSG000000039304
Gm20633	ENSMUSG000000093553
Plekho2	ENSMUSG000000050721
Pkdrej	ENSMUSG000000052496
Rbm46	ENSMUSG000000033882
Rnf138rt1	ENSMUSG000000083695
Col22a1	ENSMUSG000000079022
Clspn	ENSMUSG000000042489
0610040B10Rik	ENSMUSG000000089889
Gm12178	ENSMUSG000000081952
Cd180	ENSMUSG000000021624

Tnfrsf25	ENSMUSG00000024793
Zglp1	ENSMUSG00000079681
Rtp1	ENSMUSG00000033383
Atoh8	ENSMUSG00000037621
8430408G22Rik	ENSMUSG00000048489
Tm6sf2	ENSMUSG00000036151
Gpr3	ENSMUSG00000049649
Map3k19	ENSMUSG00000051590
Zdbf2	ENSMUSG00000027520
Agxt2l1	ENSMUSG00000019232
Dnase1l2	ENSMUSG00000024136
Plekhf1	ENSMUSG00000074170
Per1	ENSMUSG00000020893
Gadd45b	ENSMUSG00000015312
Nr4a2	ENSMUSG00000026826
Sgk1	ENSMUSG00000019970
Plin4	ENSMUSG00000002831
Cdkn1a	ENSMUSG00000023067
Gm11201	ENSMUSG00000085941
Gem	ENSMUSG00000028214
Dusp6	ENSMUSG00000019960
1810011O10Rik	ENSMUSG00000056313
Noxred1	ENSMUSG00000072919
Errfi1	ENSMUSG00000028967
Arl5b	ENSMUSG00000017418
Crip3	ENSMUSG00000023968
Tiparp	ENSMUSG00000034640
Ankrd53	ENSMUSG00000014747
Rasl11a	ENSMUSG00000029641
Utp14b	ENSMUSG00000079470
Nfil3	ENSMUSG00000056749
Tsc22d3	ENSMUSG00000031431
Midn	ENSMUSG00000035621
Coq10b	ENSMUSG00000025981
Arl4d	ENSMUSG00000034936
1700102P08Rik	ENSMUSG00000032611
Fas	ENSMUSG00000024778
Dio2	ENSMUSG00000007682
Arid5a	ENSMUSG00000037447
Per2	ENSMUSG00000055866
Mlph	ENSMUSG00000026303
Bag3	ENSMUSG00000030847
Hpn	ENSMUSG00000001249
Irs2	ENSMUSG00000038894
Plk3	ENSMUSG00000028680
Mir374	ENSMUSG00000076269
Dnajb1	ENSMUSG00000005483
Jhdm1d	ENSMUSG00000042599
Gm15478	ENSMUSG00000085363
Sertad1	ENSMUSG00000008384
Dusp1	ENSMUSG00000024190
Spry4	ENSMUSG00000024427
Gpt2	ENSMUSG00000031700
Acer2	ENSMUSG00000038007
Dnajb5	ENSMUSG00000036052
Chrm4	ENSMUSG00000040495
A930039A15Rik	ENSMUSG00000078493



Nptx2	ENSMUSG00000059991
Gm13502	ENSMUSG00000083287
Dok3	ENSMUSG00000035711
Pcsk1	ENSMUSG00000021587
P4ha1	ENSMUSG00000019916
Hspb1	ENSMUSG00000004951
Zswim6	ENSMUSG00000032846
Klf2	ENSMUSG00000055148
Fastkd5	ENSMUSG00000079043
Gm13830	ENSMUSG00000086368
Uba6	ENSMUSG00000035898
Spata2l	ENSMUSG00000033594
Ppp1r3g	ENSMUSG00000050423

**Table S3: Pathway analysis on differentially expressed genes.**

While MAPK signaling was normally induced in *Kat2a* cKO mice, genes functioning in “neuroactive ligand-receptor interaction” were commonly significantly enriched among down-regulated genes in the CA1 of *Kat2a* cKO mice. Genes selected for subsequent qPCR analysis are marked in **bold**.

WT vs. <i>Kat2a</i> cKO naïve	Up	No enriched pathway found	-	-	-
	Down	Neuroactive ligand-receptor interaction	4.3E-3	2.6E-2	<b>Htr2c, Ghsr, Hctr2, Npbwr1</b>
	All	Neuroactive ligand-receptor interaction	3.8E-3	3.6E-2	<b>Htr2c, Ghsr, Hctr2, Npbwr1, P2rx5, Tbx2r</b>
WT naïve vs. novelty	Up	MAPK signaling pathway	1.5E-4	1.4E-3	<i>Fas, Fos, Dusp 4, Dusp5, Dusp6, Gadd45b, Nr4a1</i>
		Adipocytokine signaling pathway	1.3E-3	1.2E-2	<i>Adipor2, Irs2, Nfkb1a, Slc2a1</i>
	Down	No enriched pathway found	-	-	-
All	MAPK signaling pathway	1.7E-4	1.6E-3	<i>Fas, Fos, Dusp4, Dusp5, Dusp6, Nr4a, Egf, Gadd45b</i>	
	Adipocytokine signaling pathway	2.4E-4	2.4E-3	<i>Adipor2, Irs2, Irs4, Nfkb1a, Slc2a1</i>	
<i>Kat2a</i> cKO naïve vs. novelty	Up	MAPK signaling pathway	1.9E-5	1.7E-4	<i>Fas, Fos, Dusp1, Dusp5, Dusp6, Nr4a1, Gadd45b, Hspb1</i>
	Down	No enriched pathway found	-	-	-
	All	MAPK signaling pathway	5.4E-5	5.1E-4	<i>Fas, Fos, Dusp1, Dusp5, Dusp6, Nr4a1, Gadd45b, Hspb1, Il1a</i>
WT novelty vs. <i>Kat2a</i> cKO novelty	Up	ECM-receptor interaction	6.4E-4	5.9E-3	<i>Col5a3, Col6a1, Col6a2, Itgb7, Thbs3, Figf</i>
		Focal adhesion	2.3E-3	2.2E-2	
	Down	Neuroactive ligand-receptor interaction	4.5E-5	2.8E-4	<b>Htr1a, Htr1b, Htr2a, Ghsr, Mc4r, Npbwr1, Oprk1</b>
	All	Neuroactive ligand-receptor interaction	2.4E-5	2.3E-4	<b>Htr1a, Htr1b, Htr2a, Ghsr, Lpar2, Mc4r, Npbwr1, Oprk1, Tacr1, Tacr2, Tbx2r</b>
ECM-receptor interaction		3.9E-3	3.6E-2	<i>Col5a3, Col6a1, Col6a2, Itgb7, Thbs3</i>	

**Table S4: miRNome of the mouse CA1 region ranked by normalized readcount**

No significant differences were observed between control and *Kat2a* cKO mice (n=6). There are slight but non-significant changes in the order of the Top50-ranked (**bold**) miRNAs

<b>Rank</b>	<b>All miRNAs &gt;10 reads (from controls)</b>	<b><i>Kat2a</i> cKO</b>
1	mmu-miR-127	mmu-miR-127
2	mmu-miR-181a	mmu-miR-181a
3	mmu-miR-26a	mmu-miR-26a
4	mmu-miR-22	mmu-miR-22
5	mmu-miR-434-3p	mmu-miR-434-3p
6	mmu-miR-9	mmu-miR-9
7	mmu-miR-191	mmu-miR-191
8	mmu-let-7f	mmu-let-7f
9	mmu-miR-128	mmu-miR-128
10	mmu-miR-92b	mmu-miR-92b
		mmu-miR-125b-
11	mmu-miR-125b-5p	5p
12	mmu-let-7c	mmu-let-7c
13	mmu-miR-30a	mmu-miR-30a
14	mmu-miR-30d	mmu-miR-99b
15	mmu-miR-99b	mmu-miR-30d
16	mmu-miR-27b	mmu-miR-27b
17	mmu-miR-411	mmu-miR-410
18	mmu-miR-29a	mmu-miR-16
19	mmu-miR-16	mmu-miR-143
20	mmu-miR-30e	mmu-miR-126-5p
21	mmu-let-7a	mmu-let-7i
22	mmu-let-7i	mmu-miR-29a
23	mmu-miR-126-5p	mmu-miR-181c
24	mmu-miR-410	mmu-miR-411
25	mmu-miR-125a-5p	mmu-let-7a
26	mmu-miR-143	mmu-miR-30e
		mmu-miR-125a-
27	mmu-miR-30c	5p
28	mmu-miR-181c	mmu-miR-30c
29	mmu-miR-486	mmu-miR-486
30	mmu-miR-3107	mmu-miR-3107
31	mmu-let-7g	mmu-let-7g
32	mmu-miR-136*	mmu-miR-136*
33	mmu-miR-181b	mmu-miR-148a
34	mmu-miR-151-5p	mmu-miR-186
35	mmu-miR-186	mmu-miR-181b
36	mmu-miR-541	mmu-miR-151-3p
37	mmu-miR-151-3p	mmu-miR-103
38	mmu-miR-148a	mmu-miR-151-5p
39	mmu-miR-103	mmu-miR-132
40	mmu-miR-138	mmu-miR-138
41	mmu-miR-381	mmu-miR-541

42	<b>mmu-miR-132</b>	<b>mmu-miR-381</b>
43	<b>mmu-miR-204</b>	<b>mmu-miR-204</b>
44	<b>mmu-miR-218</b>	<b>mmu-miR-100</b>
45	<b>mmu-let-7d</b>	<b>mmu-miR-26b</b>
46	<b>mmu-let-7b</b>	<b>mmu-miR-218</b>
47	<b>mmu-miR-101a</b>	<b>mmu-miR-101a</b>
48	<b>mmu-miR-338-3p</b>	<b>mmu-let-7d</b>
49	<b>mmu-miR-153</b>	<b>mmu-let-7b</b>
50	<b>mmu-miR-300</b>	<b>mmu-miR-92a</b>
51	mmu-miR-100	mmu-miR-99a
52	mmu-miR-26b	mmu-miR-338-3p
53	mmu-miR-92a	mmu-miR-153
54	mmu-miR-222	mmu-miR-300
55	mmu-let-7e	mmu-let-7e
56	mmu-miR-99a	mmu-miR-21
57	mmu-miR-434-5p	mmu-miR-328
58	mmu-miR-21	mmu-miR-192
59	mmu-miR-192	mmu-miR-378
60	mmu-miR-328	mmu-miR-222
61	mmu-miR-221	mmu-miR-434-5p
62	mmu-miR-30b	mmu-miR-30b
63	mmu-miR-136	mmu-miR-340-5p
64	mmu-miR-378	mmu-miR-744
65	mmu-miR-744	mmu-miR-221
66	mmu-miR-340-5p	mmu-miR-136
67	mmu-miR-29c	mmu-miR-146b
68	mmu-miR-409-3p	mmu-miR-148b
69	mmu-miR-146b	mmu-miR-150
70	mmu-miR-126-3p	mmu-miR-29c
71	mmu-miR-301a	mmu-miR-301a
72	mmu-miR-148b	mmu-miR-126-3p
73	mmu-miR-150	mmu-miR-409-3p
74	mmu-miR-330	mmu-miR-330
75	mmu-miR-9*	mmu-miR-181d
76	mmu-miR-369-5p	mmu-miR-98
77	mmu-miR-98	mmu-miR-9*
78	mmu-miR-181d	mmu-miR-24
79	mmu-miR-23b	mmu-miR-30e*
80	mmu-miR-433	mmu-miR-107
		mmu-miR-1843b-5p
81	mmu-miR-30e*	5p
82	mmu-miR-149	mmu-miR-23b
83	mmu-miR-24	mmu-miR-149
84	mmu-miR-342-3p	mmu-miR-342-3p
85	mmu-miR-1843b-5p	mmu-miR-1843-5p
86	mmu-miR-107	mmu-miR-101b
87	mmu-miR-181a-1*	mmu-miR-139-5p
88	mmu-miR-129-5p	mmu-miR-369-5p
89	mmu-miR-487b	mmu-let-7d*
90	mmu-miR-34c	mmu-miR-129-5p

91	mmu-miR-125b-2-3p	mmu-miR-181a-1*
92	mmu-miR-139-5p	mmu-miR-433
		mmu-miR-125b-2-3p
93	mmu-let-7d*	3p
94	mmu-miR-3065	mmu-miR-488
95	mmu-miR-1843-5p	mmu-miR-1839-5p
96	mmu-miR-101b	mmu-miR-487b
97	mmu-miR-488	mmu-miR-341
98	mmu-miR-341	mmu-miR-212-5p
		mmu-miR-129-2-3p
99	mmu-miR-344d	3p
100	mmu-miR-384-5p	mmu-miR-212-3p
101	mmu-miR-129-2-3p	mmu-miR-425
102	mmu-miR-1839-5p	mmu-miR-344d
103	mmu-miR-425	mmu-miR-3065
104	mmu-miR-212-3p	mmu-miR-25
105	mmu-miR-212-5p	mmu-miR-130a
106	mmu-miR-708*	mmu-miR-384-5p
107	mmu-miR-376b*	mmu-miR-30a*
108	mmu-miR-380-3p	mmu-miR-23a
109	mmu-miR-30a*	mmu-miR-708*
110	mmu-miR-130a	mmu-miR-195
111	mmu-miR-872	mmu-miR-1249
112	mmu-miR-132*	mmu-miR-34c
113	mmu-miR-195	mmu-miR-484
114	mmu-miR-668	mmu-miR-872
115	mmu-miR-484	mmu-miR-132*
116	mmu-miR-1249	mmu-miR-380-3p
117	mmu-miR-25	mmu-miR-335-3p
118	mmu-miR-219-3p	mmu-miR-668
119	mmu-miR-335-3p	mmu-miR-497
120	mmu-miR-879	mmu-miR-181c*
121	mmu-miR-23a	mmu-miR-532-5p
122	mmu-miR-146a	mmu-miR-376b*
123	mmu-miR-361	mmu-miR-879
124	mmu-miR-497	mmu-miR-361
125	mmu-miR-181c*	mmu-miR-598
126	mmu-miR-29b	mmu-miR-146a
127	mmu-miR-532-5p	mmu-miR-219-3p
128	mmu-miR-667	mmu-miR-421
129	mmu-miR-421	mmu-miR-140*
130	mmu-miR-598	mmu-miR-874
131	mmu-miR-137	mmu-miR-664
132	mmu-miR-411*	mmu-miR-667
133	mmu-miR-128-1*	mmu-miR-137
134	mmu-miR-370	mmu-miR-29b
135	mmu-miR-673-5p	mmu-miR-128-1*
136	mmu-miR-872*	mmu-miR-673-5p
137	mmu-miR-15a	mmu-miR-872*
138	mmu-miR-874	mmu-miR-676

139	mmu-miR-383	mmu-miR-320
140	mmu-miR-320	mmu-miR-384-3p
141	mmu-miR-671-3p	mmu-miR-370
142	mmu-miR-384-3p	mmu-miR-15a
143	mmu-miR-140*	mmu-miR-671-3p
144	mmu-miR-664	mmu-miR-411*
145	mmu-miR-676	mmu-miR-666-5p
146	mmu-miR-369-3p	mmu-miR-326
147	mmu-miR-335-5p	mmu-miR-127*
148	mmu-miR-127*	mmu-miR-369-3p
149	mmu-miR-298	mmu-miR-335-5p
150	mmu-miR-666-5p	mmu-miR-383
151	mmu-miR-485	mmu-miR-330*
152	mmu-miR-379	mmu-miR-351
153	mmu-miR-10a	mmu-miR-485
154	mmu-miR-3071*	mmu-miR-423-5p
155	mmu-miR-382	mmu-miR-27a
156	mmu-miR-330*	mmu-miR-382
157	mmu-miR-351	mmu-miR-652
158	mmu-miR-423-5p	mmu-miR-10a
159	mmu-miR-666-3p	mmu-miR-298
160	mmu-miR-708	mmu-miR-495
161	mmu-miR-495	mmu-let-7b*
162	mmu-let-7b*	mmu-miR-708
163	mmu-miR-93	mmu-miR-379
164	mmu-miR-27a	mmu-miR-3071*
165	mmu-miR-423-3p	mmu-miR-93
166	mmu-miR-125b-1-3p	mmu-miR-501-3p
167	mmu-let-7c-2*	mmu-miR-409-5p
		mmu-miR-125b-1-3p
168	mmu-let-7a-1*	mmu-miR-24-2*
169	mmu-miR-652	mmu-miR-423-3p
170	mmu-miR-3475	mmu-miR-666-3p
171	mmu-miR-135a	mmu-miR-331-3p
172	mmu-miR-873	mmu-miR-451
173	mmu-miR-329*	mmu-miR-3059
174	mmu-miR-31	mmu-miR-3475
175	mmu-miR-409-5p	mmu-miR-31
176	mmu-miR-154	mmu-miR-329*
177	mmu-miR-501-3p	mmu-let-7c-2*
178	mmu-miR-323-3p	mmu-let-7a-1*
179	mmu-miR-3059	mmu-miR-187
180	mmu-miR-24-2*	mmu-miR-3068*
181	mmu-miR-194	mmu-miR-145
182	mmu-miR-326	mmu-miR-323-3p
183	mmu-miR-145	mmu-miR-194
184	mmu-miR-451	mmu-miR-135a
185	mmu-miR-3068*	mmu-miR-154
186	mmu-miR-338-5p	mmu-miR-344
187	mmu-miR-379*	

188	mmu-miR-7a	mmu-miR-873
189	mmu-miR-1198-5p	mmu-miR-1198-5p
190	mmu-miR-142-5p	mmu-miR-338-5p
191	mmu-miR-376a*	mmu-miR-379*
192	mmu-miR-187	mmu-miR-376a*
193	mmu-miR-331-3p	mmu-miR-344b
194	mmu-miR-1298*	mmu-miR-142-5p
195	mmu-miR-375	mmu-miR-375
196	mmu-miR-322	mmu-miR-361*
197	mmu-miR-1298	mmu-miR-322
198	mmu-miR-361*	mmu-miR-488*
199	mmu-miR-344	mmu-miR-1298*
200	mmu-miR-551b	mmu-miR-185
201	mmu-miR-431*	mmu-miR-203
202	mmu-miR-344b	mmu-miR-431*
		mmu-miR-129-1-3p
203	mmu-miR-673-3p	3p
204	mmu-miR-185	mmu-miR-676*
205	mmu-miR-30d*	mmu-miR-30d*
206	mmu-miR-429	mmu-miR-324-5p
207	mmu-miR-676*	mmu-miR-7a
208	mmu-miR-221*	mmu-miR-673-3p
209	mmu-miR-28	mmu-miR-28
210	mmu-miR-488*	mmu-miR-199a-3p
211	mmu-miR-873*	mmu-miR-199b
212	mmu-miR-543	mmu-miR-1298
213	mmu-miR-129-1-3p	mmu-miR-221*
214	mmu-miR-324-5p	mmu-miR-5117
215	mmu-miR-490-3p	mmu-miR-152
216	mmu-miR-5117	mmu-miR-543
217	mmu-miR-592	mmu-let-7f-2*
218	mmu-miR-376b	mmu-miR-551b
219	mmu-miR-346	mmu-miR-346
220	mmu-let-7f-2*	mmu-miR-133a
221	mmu-miR-34a	mmu-miR-3102
222	mmu-miR-3102	mmu-miR-490-3p
223	mmu-miR-431	mmu-miR-30c-2*
224	mmu-miR-329	mmu-miR-873*
225	mmu-miR-376a	mmu-miR-329
226	mmu-miR-133a	mmu-miR-592
227	mmu-miR-340-3p	mmu-miR-429
228	mmu-let-7e*	mmu-let-7e*
229	mmu-miR-485*	mmu-miR-3085-3p
230	mmu-miR-30c-2*	mmu-miR-30c-1*
231	mmu-miR-152	mmu-miR-431
232	mmu-miR-134	mmu-miR-345-5p
233	mmu-miR-30c-1*	mmu-miR-376b
234	mmu-miR-199a-3p	mmu-miR-1839-3p
235	mmu-miR-199b	mmu-miR-485*
236	mmu-miR-203	mmu-miR-340-3p

237	mmu-miR-674*	mmu-miR-674*
238	mmu-miR-200b	mmu-miR-134
239	mmu-miR-582-5p	mmu-miR-148a*
240	mmu-miR-19b	mmu-miR-1981*
241	mmu-miR-3085-3p	mmu-miR-34a
242	mmu-miR-7a-1*	mmu-miR-19b
243	mmu-miR-1981*	mmu-miR-582-5p
244	mmu-miR-182	mmu-miR-7a-1*
245	mmu-miR-148a*	mmu-miR-877*
246	mmu-miR-7b	mmu-miR-10b
247	mmu-miR-674	mmu-miR-702
248	mmu-miR-877*	mmu-miR-193b
249	mmu-miR-1839-3p	mmu-miR-365
250	mmu-miR-98*	mmu-miR-124*
251	mmu-miR-99a*	mmu-miR-148b*
252	mmu-miR-190	mmu-miR-98*
253	mmu-miR-124*	mmu-miR-190
254	mmu-miR-433*	mmu-miR-376a
255	mmu-miR-148b*	mmu-miR-99a*
256	mmu-miR-3102-3p.2	mmu-miR-664*
257	mmu-miR-702	mmu-miR-210
258	mmu-miR-2182	mmu-miR-674
259	mmu-miR-27b*	mmu-miR-200b
		mmu-miR-3102-3p.2
260	mmu-miR-29a*	mmu-miR-27b*
261	mmu-miR-365	mmu-miR-7b
262	mmu-miR-140	mmu-miR-874*
263	mmu-miR-874*	mmu-miR-140
264	mmu-miR-3099	mmu-miR-133b
265	mmu-miR-1224	mmu-miR-182
266	mmu-miR-200a	mmu-miR-770-5p
267	mmu-miR-193b	mmu-miR-433*
268	mmu-miR-345-5p	mmu-miR-2182
269	mmu-miR-133b	mmu-miR-29a*
270	mmu-miR-744*	mmu-miR-22*
271	mmu-miR-3078	mmu-miR-3099
272	mmu-miR-210	mmu-miR-1224
273	mmu-miR-664*	mmu-miR-106b
274	mmu-miR-1247	mmu-miR-744*
275	mmu-miR-106b	mmu-miR-7a-2*
276	mmu-miR-101a*	mmu-miR-145*
277	mmu-miR-770-5p	mmu-miR-677
278	mmu-miR-7a-2*	mmu-miR-770-3p
279	mmu-miR-22*	mmu-miR-101a*
280	mmu-miR-770-3p	mmu-miR-3078
281	mmu-miR-145*	mmu-miR-99b*
282	mmu-miR-376c	mmu-miR-191*
283	mmu-miR-377*	mmu-miR-377*
284	mmu-miR-191*	mmu-miR-672
285	mmu-miR-219-5p	



286	mmu-miR-677	mmu-miR-28*
287	mmu-miR-130b	mmu-miR-1247
288	mmu-miR-672	mmu-miR-376c
289	mmu-miR-425*	mmu-miR-17
290	mmu-miR-17	mmu-miR-130b
291	mmu-miR-671-5p	mmu-miR-200a
292	mmu-miR-28*	mmu-miR-532-3p
293	mmu-miR-342-5p	mmu-miR-3082-3p
294	mmu-miR-99b*	mmu-miR-1843-3p
295	mmu-miR-15b	mmu-miR-152*
296	mmu-miR-532-3p	mmu-miR-425*
297	mmu-miR-325	mmu-miR-374
298	mmu-miR-296-5p	mmu-let-7i*
299	mmu-miR-3082-3p	mmu-miR-342-5p
300	mmu-miR-10b	mmu-miR-29c*
301	mmu-miR-700*	mmu-miR-195*
302	mmu-miR-764-3p	mmu-miR-15b
303	mmu-miR-20a	mmu-miR-339-3p
304	mmu-miR-574-3p	mmu-miR-700*
305	mmu-miR-195*	mmu-miR-1983
306	mmu-miR-374	mmu-miR-455
307	mmu-miR-1843-3p	mmu-let-7f-1*
308	mmu-miR-222*	mmu-miR-296-5p
309	mmu-miR-29c*	mmu-miR-671-5p
310	mmu-miR-301b	mmu-miR-500
311	mmu-miR-500	mmu-miR-574-3p
312	mmu-miR-3093-5p	mmu-miR-301b
313	mmu-miR-34b-3p	mmu-miR-222*
314	mmu-miR-1983	mmu-miR-3057-5p
315	mmu-let-7g*	mmu-miR-3093-5p
316	mmu-miR-138-1*	mmu-miR-378*
317	mmu-miR-1981	mmu-miR-325
318	mmu-miR-3061-3p	mmu-miR-3061-3p
319	mmu-let-7f-1*	mmu-miR-322*
320	mmu-miR-34b-5p	mmu-miR-20a
321	mmu-miR-130b*	mmu-miR-3084
322	mmu-miR-322*	mmu-miR-1981
323	mmu-let-7i*	mmu-let-7g*
324	mmu-miR-299*	mmu-miR-106b*
325	mmu-miR-106b*	mmu-miR-1224*
326	mmu-miR-339-3p	mmu-miR-138-1*
327	mmu-miR-1224*	mmu-miR-130b*
328	mmu-miR-378*	mmu-miR-3068
329	mmu-miR-344d-3*	mmu-miR-219-5p
330	mmu-miR-3068	mmu-miR-125a-3p
331	mmu-miR-496	mmu-miR-299*
332	mmu-miR-218-2*	mmu-miR-764-3p
333	mmu-miR-3084	mmu-miR-24-1*
334	mmu-miR-152*	mmu-miR-34b-3p
335	mmu-miR-135b	mmu-miR-337-3p

336	mmu-miR-125a-3p	mmu-miR-218-2*
337	mmu-miR-337-3p	mmu-miR-128-2*
338	mmu-miR-299	mmu-miR-299
339	mmu-miR-3057-5p	mmu-miR-496
340	mmu-miR-128-2*	mmu-miR-26b*
341	mmu-miR-26b*	mmu-miR-344c
342	mmu-miR-543*	mmu-miR-144*
343	mmu-miR-879*	mmu-miR-1947
344	mmu-miR-377	mmu-miR-879*
345	mmu-miR-144*	mmu-miR-344d-3*
346	mmu-miR-24-1*	mmu-miR-3083
347	mmu-miR-3083	mmu-miR-339-5p
348	mmu-miR-344c	mmu-miR-350
349	mmu-miR-350	mmu-miR-504
350	mmu-miR-218-1*	mmu-miR-188-5p
351	mmu-miR-135a-2*	mmu-miR-377
		mmu-miR-3096b-5p
352	mmu-miR-188-5p	mmu-miR-138-2*
353	mmu-miR-455	mmu-miR-323-5p
354	mmu-miR-339-5p	mmu-miR-543*
355	mmu-miR-323-5p	mmu-miR-30b*
356	mmu-miR-138-2*	mmu-miR-218-1*
357	mmu-miR-30b*	mmu-miR-135a-2*
358	mmu-miR-183	mmu-miR-34b-5p
359	mmu-miR-504	mmu-miR-210*
360	mmu-miR-1947	mmu-miR-539-5p
361	mmu-miR-21*	mmu-miR-135b
362	mmu-miR-3096b-5p	mmu-miR-139-3p
363	mmu-miR-139-3p	mmu-miR-183
364	mmu-miR-539-5p	mmu-miR-21*
365	mmu-miR-210*	mmu-miR-184
366	mmu-miR-679-5p	mmu-miR-486*
367	mmu-miR-184	mmu-miR-455*
368	mmu-miR-1264-3p	mmu-miR-380-5p
369	mmu-miR-3087	mmu-miR-362-3p
370	mmu-miR-93*	mmu-miR-345-3p
371	mmu-miR-455*	mmu-let-7c-1*
372	mmu-miR-34c*	mmu-miR-3060
373	mmu-miR-325*	mmu-miR-199a-5p
374	mmu-miR-380-5p	mmu-miR-93*
375	mmu-miR-362-3p	mmu-miR-1943
376	mmu-miR-450b-5p	mmu-miR-142-3p
377	mmu-let-7c-1*	mmu-miR-325*
378	mmu-miR-1943	mmu-miR-679-5p
379	mmu-miR-193	mmu-miR-450b-5p
380	mmu-miR-3060	mmu-miR-193
381	mmu-miR-33	mmu-miR-3087
382	mmu-miR-3072	mmu-miR-467a
383	mmu-miR-450a	mmu-miR-26a-2*
384	mmu-miR-345-3p	

385	mmu-miR-669c	mmu-miR-3072
386	mmu-miR-491	mmu-miR-1264-3p
387	mmu-miR-142-3p	mmu-miR-34c*
388	mmu-miR-700	mmu-miR-700
389	mmu-miR-448-3p	mmu-miR-448-3p
390	mmu-miR-486*	mmu-miR-1964-3p
391	mmu-miR-300*	mmu-miR-491
392	mmu-miR-1964-3p	mmu-miR-7b*
393	mmu-miR-544-3p	mmu-miR-450a
394	mmu-miR-467a	mmu-miR-669c
395	mmu-miR-185*	mmu-miR-215
396	mmu-miR-32	mmu-miR-32
397	mmu-miR-26a-2*	mmu-miR-33
398	mmu-miR-412-5p	mmu-miR-412-5p
399	mmu-miR-582-3p	mmu-miR-300*
400	mmu-miR-7b*	mmu-miR-185*
401	mmu-miR-542-3p	mmu-miR-3061-5p
402	mmu-miR-33*	mmu-miR-544-3p
403	mmu-miR-154*	mmu-miR-1982.1
404	mmu-miR-667*	mmu-miR-542-3p
405	mmu-miR-3061-5p	mmu-miR-582-3p
406	mmu-miR-1982.1	mmu-miR-3074-5p
407	mmu-miR-199a-5p	mmu-miR-31*
408	mmu-miR-540-5p	mmu-miR-219-3p*
409	mmu-miR-3069-3p	mmu-miR-33*
410	mmu-miR-215	mmu-miR-154*
411	mmu-miR-17*	mmu-miR-667*
412	mmu-miR-3074-5p	mmu-miR-540-5p
413	mmu-miR-1197	mmu-miR-3069-5p
414	mmu-miR-296-3p	mmu-miR-331-5p
415	mmu-miR-1193-3p	mmu-miR-1193-3p
416	mmu-miR-107*	mmu-miR-3069-3p
417	mmu-miR-19a	mmu-miR-17*
418	mmu-miR-219-3p*	mmu-miR-211
419	mmu-miR-92a-1*	mmu-miR-1197
420	mmu-miR-211	mmu-miR-92a-1*
421	mmu-miR-539-3p	mmu-let-7a-2*
422	mmu-miR-1a	mmu-miR-29b-1*
		mmu-miR-3074-1-
423	mmu-miR-337-5p	3p
424	mmu-miR-29b-1*	mmu-miR-19a
425	mmu-miR-362-5p	mmu-miR-449a
426	mmu-miR-29b-2*	mmu-miR-362-5p
427	mmu-miR-3074-1-3p	mmu-miR-141
428	mmu-miR-1b-5p	mmu-miR-1a
429	mmu-miR-551b*	mmu-miR-187*
430	mmu-miR-544-5p	mmu-miR-296-3p
431	mmu-miR-155	mmu-miR-27a*
432	mmu-miR-494	mmu-miR-1b-5p
433	mmu-miR-672*	mmu-miR-107*

434	mmu-miR-467e	mmu-miR-3093-3p
435	mmu-miR-3069-5p	mmu-miR-491*
436	mmu-miR-31*	mmu-miR-186*
437	mmu-miR-100*	mmu-miR-155
438	mmu-miR-188-3p	mmu-miR-467e
439	mmu-miR-505-3p	mmu-miR-670*
440	mmu-miR-331-5p	mmu-miR-337-5p
441	mmu-miR-449a	mmu-miR-208b
442	mmu-miR-186*	mmu-miR-16-1*
443	mmu-miR-190*	mmu-miR-672*
444	mmu-let-7a-2*	mmu-miR-100*
445	mmu-miR-92b*	mmu-miR-3077
446	mmu-miR-467d	mmu-miR-381*
447	mmu-miR-3093-3p	mmu-miR-551b*
448	mmu-miR-3077	mmu-miR-505-3p
449	mmu-miR-669a-3p	mmu-miR-92b*
450	mmu-miR-669o-3p	mmu-miR-669a-3p
451	mmu-miR-1948	mmu-miR-669o-3p
452	mmu-miR-505-5p	mmu-miR-3084*
453	mmu-miR-15b*	mmu-miR-505-5p
454	mmu-miR-3071	mmu-miR-544-5p
455	mmu-miR-381*	mmu-miR-494
456	mmu-miR-27a*	mmu-miR-1948
457	mmu-miR-25*	mmu-miR-1982.2
458	mmu-miR-137*	mmu-miR-190*
459	mmu-miR-448-5p	mmu-miR-188-3p
460	mmu-miR-3084*	mmu-miR-690
461	mmu-miR-466p-3p	mmu-miR-143*
462	mmu-miR-466b-3p	mmu-miR-137*
463	mmu-miR-466c-3p	mmu-miR-1251
464	mmu-miR-187*	mmu-miR-539-3p
465	mmu-miR-670*	mmu-miR-190b
466	mmu-miR-190b	mmu-miR-15b*
467	mmu-miR-141	mmu-miR-467d
468	mmu-miR-690	mmu-miR-223
469	mmu-miR-1251	mmu-miR-29b-2*
470	mmu-miR-3572	mmu-miR-3071
471	mmu-miR-208b	mmu-miR-3572
472	mmu-miR-16-1*	mmu-miR-3103
473	mmu-miR-466a-3p	mmu-miR-421*
474	mmu-miR-466e-3p	mmu-miR-487b*
475	mmu-miR-574-5p	mmu-miR-204*
476	mmu-miR-1982.2	mmu-miR-25*
477	mmu-miR-223	mmu-miR-26a-1*
478	mmu-miR-150*	mmu-miR-344f-3p
479	mmu-miR-421*	mmu-miR-466p-3p
480	mmu-miR-1264-5p	mmu-miR-466b-3p
481	mmu-miR-487b*	mmu-miR-466c-3p
		mmu-miR-3102-
482	mmu-miR-3076-3p	5p.2

483	mmu-miR-499	mmu-miR-18a*
484	mmu-miR-143*	mmu-miR-150*
485	mmu-miR-18a*	mmu-miR-410*
486	mmu-miR-344f-3p	mmu-miR-466a-3p
487	mmu-miR-18a	mmu-miR-466e-3p
488	mmu-miR-26a-1*	mmu-miR-448-5p
489	mmu-miR-3102-5p.2	mmu-miR-1264-5p
490	mmu-miR-3103	mmu-miR-301a*
491	mmu-miR-410*	mmu-miR-3076-3p
492	mmu-miR-301a*	mmu-miR-574-5p
493	mmu-miR-495*	mmu-miR-499
494	mmu-miR-491*	mmu-miR-495*
495	mmu-miR-204*	mmu-miR-18a

**Table S5: Primers used in the study**

<b>Name</b>	<b>Target</b>	<b>Forward primer (5'-&gt;3')</b>	<b>Reverse primer (5'-&gt;3')</b>
<i>Kat2a</i>	mRNA	GAAGAGGACCCTCATCCTCA	GGAGAATTTGCCCGTAGAT
<i>Htr1a</i>	mRNA	CCCCTTCAGCTGTATCTTTCC	AAAATGCAGCACGGGTTTT
<i>Htr1b</i>	mRNA	GTCCTGCTGGTTGCTTTGTT	TCCGATACACCGTAGCGATT
<i>Htr2a</i>	mRNA	CTGCTGGGTTTCCTTGTCAT	GTAAATCCAGACGGCACAGAG
<i>Htr2c</i>	mRNA	TGCTTAAAAGTGAAGCAATAATGG	AGGCCAATTAGGTGCACAAG
<i>Hcrtr2</i>	mRNA	GCTCACCAGCATAAGCACAC	GGTACTCCCTGCTGTAGATACCA
<i>Penk</i>	mRNA	CCCAGGCGACATCAATTT	TCTCCCAGATTTTGAAAGAAGG
<i>Npbwr1</i>	mRNA	TCGTCTACGGGGTAATTTGC	GTACGTACAGCACCGCAGAG
<i>Hprt</i>	mRNA Reference	TCCTCCTCAGACCGCTTTT	CCTGGTTCATCATCGCTAATC
<i>Hcrtr2</i> promoter	ChIP DNA, predicted NFκB- binding site	GCTCTTAGGCAGCTTCTCC	CAATGCCTCCAGAGCCTTG
<i>Npbwr1</i> promoter	ChIP DNA, predicted NFκB- binding site	TTCCTCCCTGACCTCCCC	TTACCTGGCGAGTCCCAGC

**Table S6 Edited variant frequency of Htr2c mRNA.**

Comparison to published dataset using 454 pyrosequencing (significant changes in *Kat2a* cKO mice are marked in bold, increased:red; decreased:blue)

Rank	Average relative occurrence in control CA1	Edited sites / Isoform	Sequence of edited cassette as seen in RNA-seq data	Edited protein sequence	Average relative occurrence in hypothalamus (Schellekens et al.,2012)
1	41.51%	ABD	GTGCGTAATCCTG	VNV	33.58%
2	<b>10.60%</b>	<b>ABCD</b>	<b>GTGCGTAGTCCTG</b>	<b>VSV</b>	11.32%
3	<b>10.50%</b>	<b>AB</b>	<b>GTGCGTAATCCTA</b>	<b>VNI</b>	19.31%
4	8.25%	(unedited)	ATACGTAATCCTA	INI	6.24%
5	7.19%	A	GTACGTAATCCTA	VNI	8.68%
6	5.63%	ABC	GTGCGTAGTCCTA	VSI	8.82%
7	<b>4.44%</b>	<b>D</b>	<b>ATACGTAATCCTG</b>	<b>INV</b>	2.66%
8	2.10%	AD	GTACGTAATCCTG	VNV	<1%
9	1.49%	AC	GTACGTAGTCCTA	VSI	1.11%
10	1.23%	ACD	GTACGTAGTCCTG	VSV	<1%
11	<1%	AE	GTACGTGATCCTA	VDI	<1%
11	<1%	C	ATACGTAGTCCTA	ISI	<1%
11	<1%	DE	ATACGTGATCCTG	IDV	<1%
11	<1%	ABCDE	GTGCGTGGTCCTG	VGW	<1%
11	<1%	ABCE	GTGCGTGGTCCTA	VDV	<1%
11	<1%	ABDE	GTGCGTAGTCCTG	VDV	<1%
11	<1%	ABE	GTGCGTAGTCCTA	VDI	<1%
11	<1%	ACDE	GTGCGTGGTCCTA	VGW	<1%
11	<1%	ACE	GTACGTGGTCCTA	VGI	<1%
11	<1%	ADE	GTACGTGATCCTG	VDV	<1%
11	<1%	B	ATGCGTAATCCTA	MNI	<1%
11	<1%	BC	ATGCGTAGTCCTA	MSI	<1%
11	<1%	BCD	ATGCGTAGTCCTG	MSV	<1%
11	<1%	BCDE	ATGCGTGGTCCTG	MGV	<1%
11	<1%	BD	ATGCGTAATCCTG	MNV	<1%
11	<1%	BDE	ATGCGTAGTCCTG	MDV	<1%
11	<1%	BE	ATGCGTAGTCCTA	MDI	<1%
11	<1%	BCE	ATGCGTGGTCCTA	MGI	<1%
11	<1%	CD	ATACGTAGTCCTG	ISV	<1%
11	<1%	CDE	ATACGTGGTCCTG	IGV	<1%
11	<1%	CE	ATACGTGGTCCTA	IGI	<1%
11	<1%	E	ATACGTGATCCTA	IDI	<1%