Supplemental Material

Table S1: Designed primers for RT-PCR experiment

Gene	**Forward primer**	**Reverse Primer**
CMIP	AGGCAAACCGCTACGAGATT	GGCATGGAAGTGGTCAAGAAG
UBE2A (HKG)	TGTTGGACTCCAGCGATTTTG	ACCTCCTACAGTTCGGTTTGT
RPL13A (HKG)	TCTGGAGGACTGTAAGAGGTATGC	AGACGCACAATCTTGAGAGCA
HATN10 (HKG)	TGAAGACAGCAGAAGTCAATG	CAGTAAACATGTCAGGCTAAATAA

Table S1: Designed primers for RT-PCR experiment

Table S2: overview of CNVs and genes involved (*CMIP* cases and families in order of the manuscript)

Case (family)	**CNV (span)**	**Genomic position**	**Protein coding genes (partially included in the deletion)**
1 (1)	CNV 283,91 kb	chr16: 81,347,541 – 81,631,447	*CMIP & GAN*
2 (2)	CNV 3,07 Mb	chr16: 81,475,688-84,542,217	*ADAD2, ATP2C2, CDH13, CMIP, COTL1, DNAAF1, HSBP1, HSD17B2, HSDL1, KCNG4, MBTPBS1, MEAK7, MLYCD, MPHOSPH6, NECAB2, OSGIN1, PLCG2, SDR42E1, SCL38A8, TAF1C, WFDC1*
3, 4, 5, 6 (3)	CNV 3,57 Mb	chr16: 77,983,154-81,545,828	*ATMIN, BCO1, C16orf46, CDYL2, CENPN, CLEC3A, CMC2, CMIP, DYNLRB2, GAN, GCSH, MAF, PKD1L2, WWOX*
9, 10,11 (6)	CNV 1,30 Mb	chr16: 81,228,816 – 82,529,975	*BCO1, CMIP, GAN, BCHSD17B2, MPHOSPH6, PLCG2, SDR42E1*
12 (7)	CNV 6,97 Mb	chr16: 78,704,956 – 85,673,761	*ADAD2, ATMIN, ATP2C2, BCO1, C16orf46, CDH13, CDYL2, CENPN, CIBAR2, CMC2, CMIP, COTL1, CRISPLD2, DNAAF1, DYNLRB2, GAN, GCSH, GSE1, HSBP1, HSD17B2, HSDL1, KCNG4, KIAA0513, KLHL36, MAF, MBTPBS1, MEAK7, MLYCD, MPHOSPH6, NECAB2, OSGIN1, PKD1L2, PLCG2, SDR42E1, SCL38A8, TAF1C, USP10, WFDC1, WWOX, ZDHHC7*
13 (8)	CNV 2,21 Mb	chr16: 79,455,147 – 81,666,403	*ATMIN, BCO1, C16orf46, CDYL2, CENPN, CMC2, CMIP, DYNLRB2, GAN, GCSH, MAF, PKD1L2*
16, 17 (11)	CNV 4,51 Mb	chr16:79,594,460 – 84,101,782	*ATMIN, BCO1, C16orf46, CDH13, CDYL2, CENPN, CMC2, CMIP, DYNLRB2, GAN, GCSH, HSBP1, HSD17B2, MAF, MBTPBS1, MLYCD, MPHOSPH6, NECAB2, OSGIN1, PKD1L2, PLCG2, SDR42E1, SCL38A8*
18, 19 (12)	CNV 1,03 Mb	chr16: 81,607,567 – 82,639,465	*CDH13, CMIP, HSD17B2, MPHOSPH6, PLCG2, SDR42E1*
20 (13)	CNV 517 kb	chr16: 81,399,465 – 81,916,173	*CMIP, PLCG2*
21 (14)	CNV 1,59 Mb	chr16: 80,093,429 – 81,683,275	*ATMIN, BCO1, C16orf46, CDYL2, CENPN, CMC2, CMIP, DYNLRB2, GAN, GCSH, PKD1L2*
22 (15)	CNV 1,67 Mb	chr16: 80,854,818-82,530,004	*ATMIN, BCO1, C16orf46, CENPN, CMC2, CMIP, GAN, GCSH, HSD17B2, MPHOSPH6, PKD1L2, PLCG2, SDR42E1*

Table S2: overview of CNVs and genes involved (*CMIP* cases and families in order of the manuscript)**.** CNV: copy number variant

Table S3: Gene–phenotype associations of protein coding genes within *CMIP* deletions

Gene Symbol	Gene name	OMIM	Phenotype	Phenotype MIM number	Inheritance
ADAD2	adenosine deaminase domain containing 2	619532			
ATMIN	ATM interactor	614693			
ATP2C2	ATPase secretory pathway Ca2+ transporting 2	613082			
BCO1	beta-carotene oxygenase 1	605748	Hypercarotenemia and vitamin A deficiency	115300	AD
C16orf46	chromosome 16 open reading frame 46				
CDH13	cadherin 13	601364			
CDYL2	chromodomain Y like 2	618816			
CENPN	centromere protein N	611509			
CIBAR2	CBY1 interacting BAR domain containing 2	617274			
CLEC3A	C-type lectin domain family 3 member A	613588			
CMC2	C-X9-C motif containing 2				
CMIP	c-Maf inducing protein	610112			
COTL1	coactosin like F-actin binding protein 1	606748			
CRISPLD2	cysteine rich secretory protein LCCL domain containing 2	612434			
DNAAF1	dynein axonemal assembly factor 1	613190	Ciliary dyskinesia, primary, 13	613193	AR
DYNLRB2	dynein light chain roadblock-type 2	607168			
GAN	gigaxonin	605379	Giant axonal neuropathy-1	256850	AR
GCSH	glycine cleavage system protein H	238330	Multiple mitochondrial dysfunctions syndrome 7	620423	AR
GSE1	Gse1 coiled-coil protein	616886			
HSBP1	heat shock factor binding protein 1	604553			
HSD17B2	hydroxysteroid 17-beta dehydrogenase 2	109685			
HSDL1	hydroxysteroid dehydrogenase like 1	619067			

KCNG4	potassium voltage-gated channel modifier subfamily G member 4	607603			
KIAA0513	KIAA0513	611675			
KLHL36	kelch like family member 36				
MAF	MAF bZIP transcription factor	177075	Ayme-Gripp syndrome	601088	AD
			Cataract 21, multiple types	610202	AD
MBTPS1	membrane bound transcription factor peptidase, site 1	603355	Spondyloepiphyseal dysplasia, Kondo-Fu type	618392	AR
MEAK7	MTOR associated protein, eak-7 homolog	619331			
MLYCD	malonyl-CoA decarboxylase	606761	Malonyl-CoA decarboxylase deficiency	248360	AR
MPHOSPH6	M-phase phosphoprotein 6	605500			
NECAB2	N-terminal EF-hand calcium binding protein 2	618130			
OSGIN1	oxidative stress induced growth inhibitor 1	607975			
PKD1L2	polycystin 1 like 2 (gene/pseudogene)	607894			
PLCG2	phospholipase C gamma 2	600220	Familial cold autoinflammatory syndrome 3	614468	AD
			Autoinflammation, antibody deficiency, and immune dysregulation syndrome	614878	AD
SDR42E1	short chain dehydrogenase/reductase family 42E, member 1	616164			
SLC38A8	solute carrier family 38 member 8	615585	Foveal hypoplasia 2, with or without optic nerve misrouting and/or anterior segment dysgenesis	609218	AR
TAF1C	TATA-box binding protein associated factor, RNA polymerase I subunit C	604905			
USP10	ubiquitin specific peptidase 10	609818			
WFDC1	WAP four-disulfide core domain 1	605322			
WWOX	WW domain containing oxidoreductase	605131	Esophageal squamous cell carcinoma, somatic	133239	
			Spinocerebellar ataxia, autosomal recessive 12	614322	AR
			Developmental and epileptic encephalopathy 28	616211	AR
ZDHHC7	zDHHC palmitoyltransferase 7	614604			

Table S3: Gene–phenotype associations of protein coding genes within *CMIP* deletions. AR: autosomal recessive, AD: autosomal dominant, MIM: Mendelian Inheritance in Man.

Figure S1

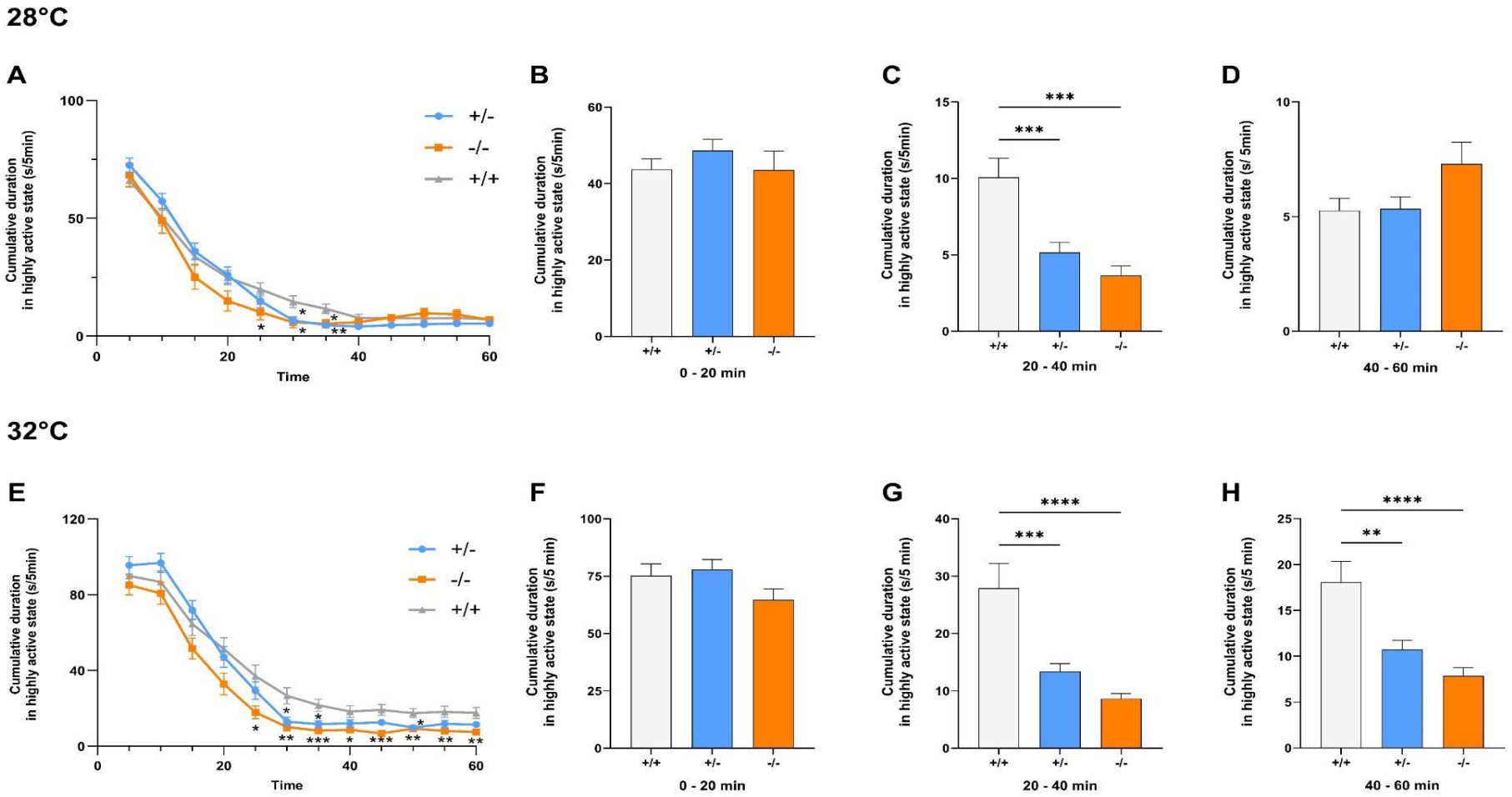

Figure S1. Cumulative duration in highly active state (s/5min) cmip mutant zebrafish larvae at 28°C and 32°C at 7 dpf. Highly active state behavior of cmip+/+ (28°C: n=58-61, 32°C: n=40-41), cmip+/- (28°C: n= 59-67, 32°C: n=41-45) and cmip-/- (28°C: n=27-32, 32°C: n=32-36°C)

larvae is recorded over a period of 60 min in the dark at (A-D) 28°C and (E-H) 32°C. Behavioral data is compared to cmip+/+ larvae and expressed as cumulative duration in highly active state (s/5min) (mean ± SEM). (A,E) Behavioral trajectory of cmip+/+, cmip+/- and cmip-/- zebrafish larvae, quantified for (B,F) the 0-20 min interval, (C,G) the 20-40 min interval and the (D,H) 40-60 min interval. (A-H) Statistical analysis was performed using (A,E) two-way ANOVA with Dunnett's multiple comparison test and (B-D,F-H) one-way ANOVA with Dunnett's multiple comparison test. Outliers were removed via the ROUT test (Q = 0.5 %) (Graphpad Prism 10, San Diego, CA, USA). Significance levels: *$p<0.05$, **$p<0.01$, ***$p<0.001$ ****$p<0.0001$.

Figure S2

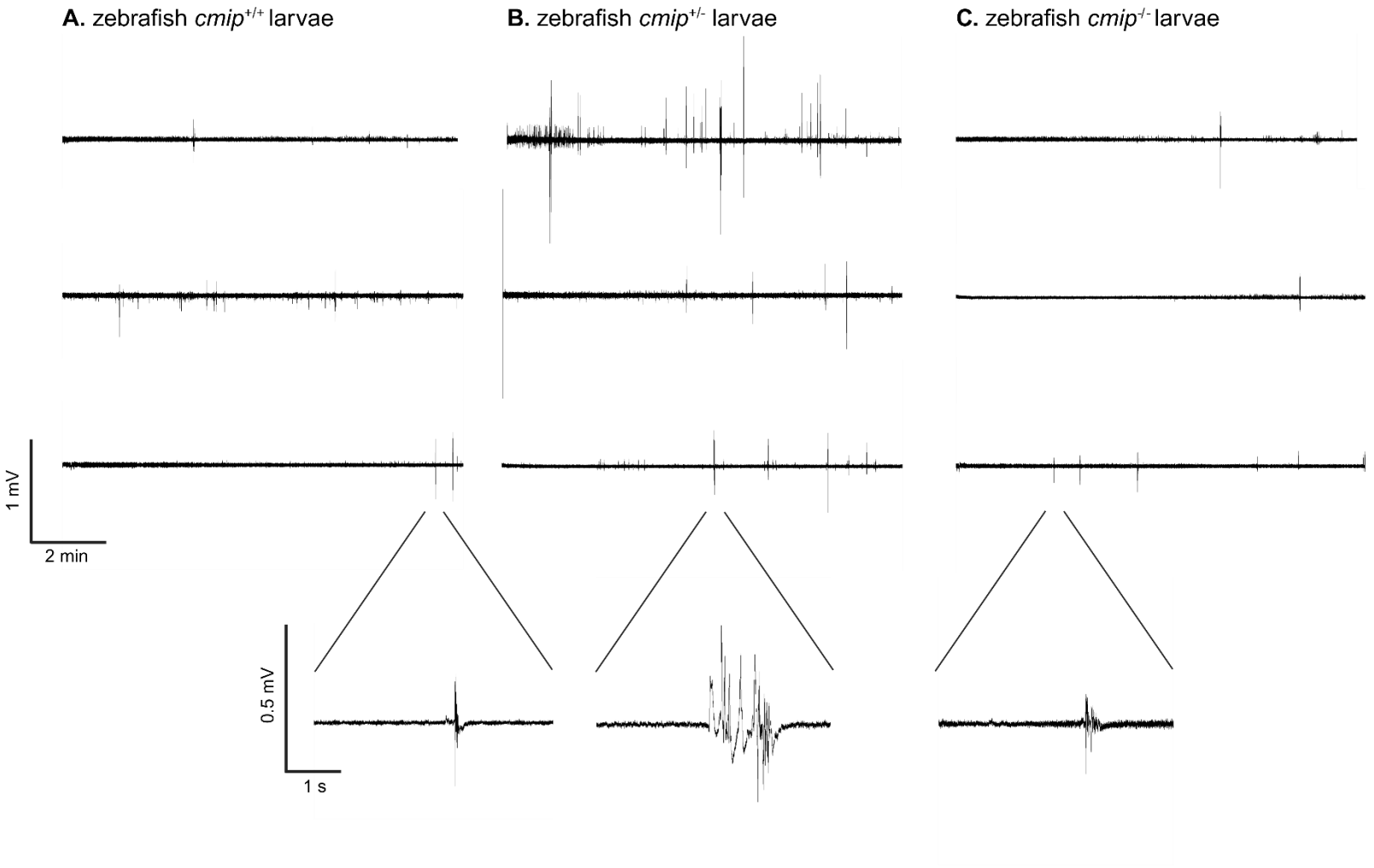
A. zebrafish cmip+/+ larvae
B. zebrafish cmip+/- larvae
C. zebrafish cmip-/- larvae
1 mV
2 min
0.5 mV
1 s

Figure S2. **Representative electrophysiological recordings in zebrafish larvae at room temperature, illustrating the frequency and amplitude of spontaneous epileptiform activity.** Ten minutes non-invasive local field potential recordings from the optic tectum of A) cmip+/+, B) cmip+/- and C) cmip-/- zebrafish larvae.