Supplemental Material Legend

Fig. S1. Generation of *Tfap2b*^{K144} and *Tfap2b*^{K145} mutant mice.

(A) Result of direct sequencing around the 5' end of intron 3 in a *Tfap2b*$^{K144/+}$ mouse. (B) Results of dCAPS for genotyping of WT, *Tfap2b*$^{K144/+}$, and *Tfap2b*$^{K144/K144}$ mice. (C) Result of direct sequencing around the boundary of intron 4 and exon 5 in a *Tfap2b*$^{K145/+}$ mouse. Note that the results of sequencing of the anti-sense DNA is shown. (D) Results of dCAPS for genotyping of WT, *Tfap2b*$^{K145/+}$, and *Tfap2b*$^{K145/K145}$ mice.

Fig. S2. Direct sequencing of *Tfap2b* mRNA in *Tfap2b* mutant mice.

Nucleotide sequence alignment of *Tfap2b* mRNA around exon 3-6. Each lane represents an individual mouse. *N*=3 mice.

Fig. S3. Whole images of Western blots (related to Fig. 2).

(A-C) Images corresponding to Fig. 2C (A), Fig. 2D (B), and Fig. 2E (C).

Fig. S4. Comparison of EEG power spectra in adult *Tfap2b*$^{+/+}$ and *Tfap2b*$^{+/-}$ mice.

Comparison of the EEG power spectrum of wakefulness, NREMS, and REMS for 24 h between male (A) or female (B) *Tfap2b*$^{+/+}$ and *Tfap2b*$^{+/-}$ mice. *N*=7 *Tfap2b*$^{+/+}$ male mice, *N*=5 *Tfap2b*$^{+/-}$ male mice, *N*=5 *Tfap2b*$^{+/+}$ female mice, *N*=3 *Tfap2b*$^{+/-}$ female mice. † indicates significant interaction between frequency and genotype in two-way repeated-measures ANOVA († † *P* < 0.01; † † † † *P* < 0.0001). * indicates significance in post-hoc Bonferroni multiple comparison test (***P* < 0.01, *****P* < 0.0001). Data are mean ± s.e.m.

Fig. S5. Comparison of EEG power spectra in adult *Tfap2b*$^{+/+}$ and *Tfap2b*$^{K145/+}$ mice.

Comparison of the EEG power spectrum of wakefulness, NREMS, and REMS for 24 h between male (A) or female (B) *Tfap2b*$^{+/+}$ and *Tfap2b*$^{K145/+}$ mice. *N*=5 *Tfap2b*$^{+/+}$ male mice, *N*=7 *Tfap2b*$^{K145/+}$ male mice, *N*=8 *Tfap2b*$^{+/+}$ female mice, *N*=9 *Tfap2b*$^{K145/+}$ female mice. † indicates significant interaction between frequency and genotype in two-way repeated-measures ANOVA († *P* < 0.05). * indicates significance in post-hoc Bonferroni multiple comparison test (***P* < 0.01, ****P* < 0.001, *****P* < 0.0001). Data are mean ± s.e.m.

Fig. S6. Comparison of EEG power spectra in adult *Tfap2b*$^{+/+}$ and *Tfap2b*$^{K144/+}$ male mice.

Comparison of the EEG power spectrum of wakefulness, NREMS, and REMS for 24 h between male (A) or female (B) *Tfap2b*$^{+/+}$ and *Tfap2b*$^{K144/+}$ mice. *N*=7 *Tfap2b*$^{+/+}$ male mice, *N*=4 *Tfap2b*$^{K144/+}$ male mice. Data are mean ± s.e.m.

Fig. S7. Comparison of bi-hourly changes in NREMS delta density.

(A-C) Comparison of bi-hourly changes in NREMS delta density in male mice between *Tfap2b*$^{+/+}$ and *Tfap2b*$^{+/-}$ mice (A), *Tfap2b*$^{+/+}$ and *Tfap2b*$^{K145/+}$ mice (B), and *Tfap2b*$^{+/+}$ and *Tfap2b*$^{K144/+}$ mice (C). (D, E) Comparison of bi-hourly changes in NREMS delta density in female mice between *Tfap2b*$^{+/+}$ and *Tfap2b*$^{+/-}$ mice (D), *Tfap2b*$^{+/+}$ and *Tfap2b*$^{K145/+}$ mice (E). (A) *N*=7 *Tfap2b*$^{+/+}$ mice, *N*=5 *Tfap2b*$^{+/-}$ mice. (B) *N*=5 *Tfap2b*$^{+/+}$ mice, *N*=7 *Tfap2b*$^{K145/+}$ mice. (C) *N*=7 *Tfap2b*$^{+/+}$ mice, *N*=4 *Tfap2b*$^{K144/+}$ mice. (D) *N*=5 *Tfap2b*$^{+/+}$ mice, *N*=3 *Tfap2b*$^{+/-}$ mice. (E) *N*=8 *Tfap2b*$^{+/+}$ mice, *N*=9 *Tfap2b*$^{K145/+}$ mice. † indicates significant interaction between ZT and genotype in two-way repeated-measures ANOVA (†††*P* < 0.001). Data are mean ± s.e.m.