



Supplemental Figure 1 *Scn8a* mutation reduces seizure susceptibility of *Celf4* heterozygous mice.

Shown is a plot of the seizure threshold of four genotypes including *Celf4* heterozygous (null/+), *Scn8a*^{8J} and respective wildtype and double mutant genotypes. Seizure threshold was expressed as the integrated root mean square (iRMS mA, AC) of current as described in Methods, plotted on a log scale. 34 adult male mice were tested beginning at 6 weeks of age: 13 wildtype, 4 *Celf4* single heterozygotes, 12 *Scn8a*^{8J} single heterozygotes, and 5 double heterozygotes from five different matings. The effect of single and double mutant genotype on iRMS was examined in a regression model. The effect of genotype on iRMS threshold was highly significant in an ANOVA model using either raw, ranked, or ranked

then-normal quantile transformed data ($F > 30$, $p < 0.001$). All pairwise combinations except $Celf4^{null/+}, Scn8a^{8J/+}$ and $Celf4^{+/+}, Scn8a^{8J/+}$ were statistically significant at $p < 0.05$ in a post-hoc Student's t-test or Tukey's HSD test. Asterisks and dashed lines denote the mean thresholds for $Celf4$ null/+ and wt from our prior study where the data were expressed in DC mA scale (Wagnon et al. 2011), now shown on the new iRMS AC mA scale to indicate that the *relative* effect is similar between $Celf4$ genotypes.