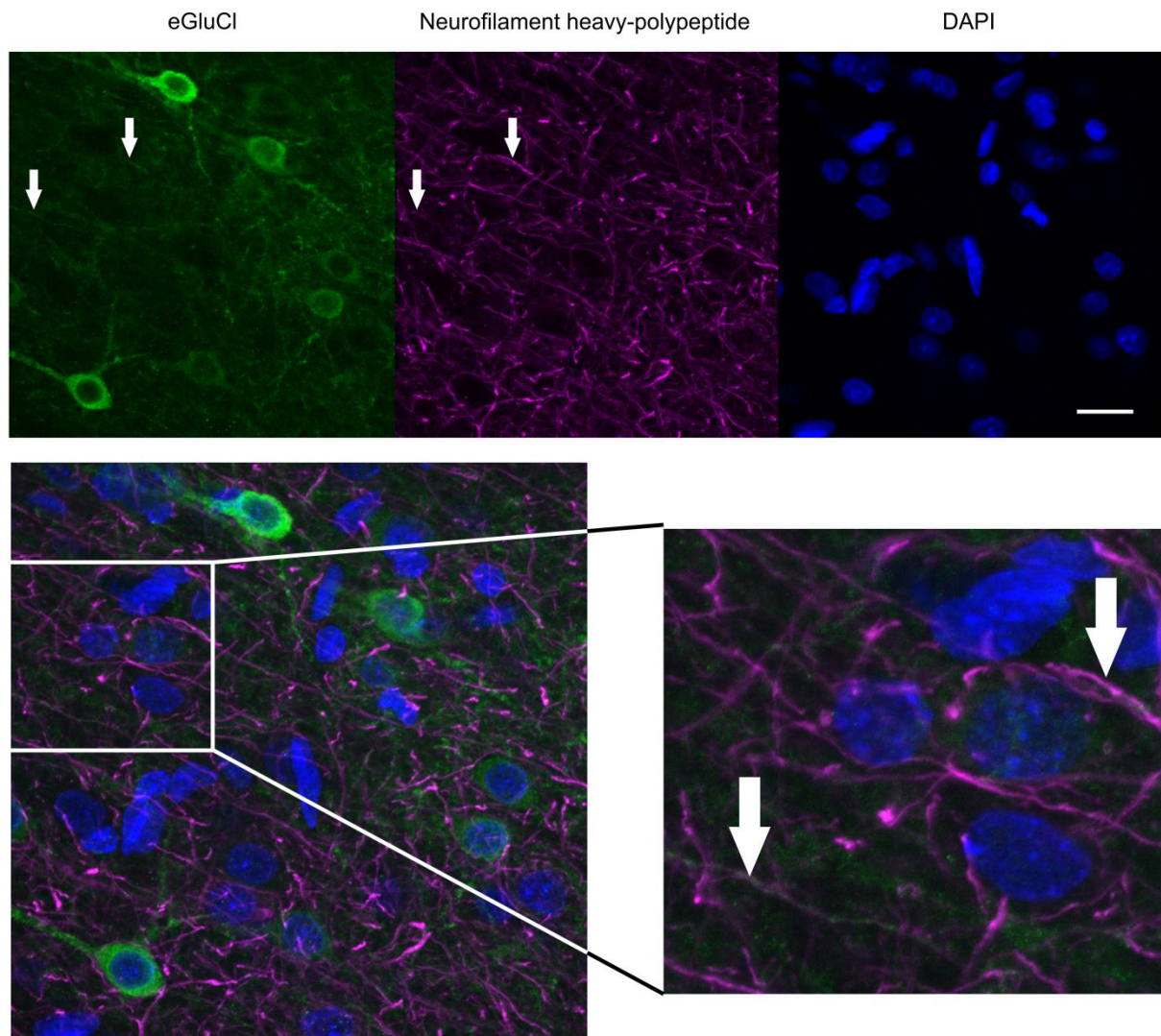
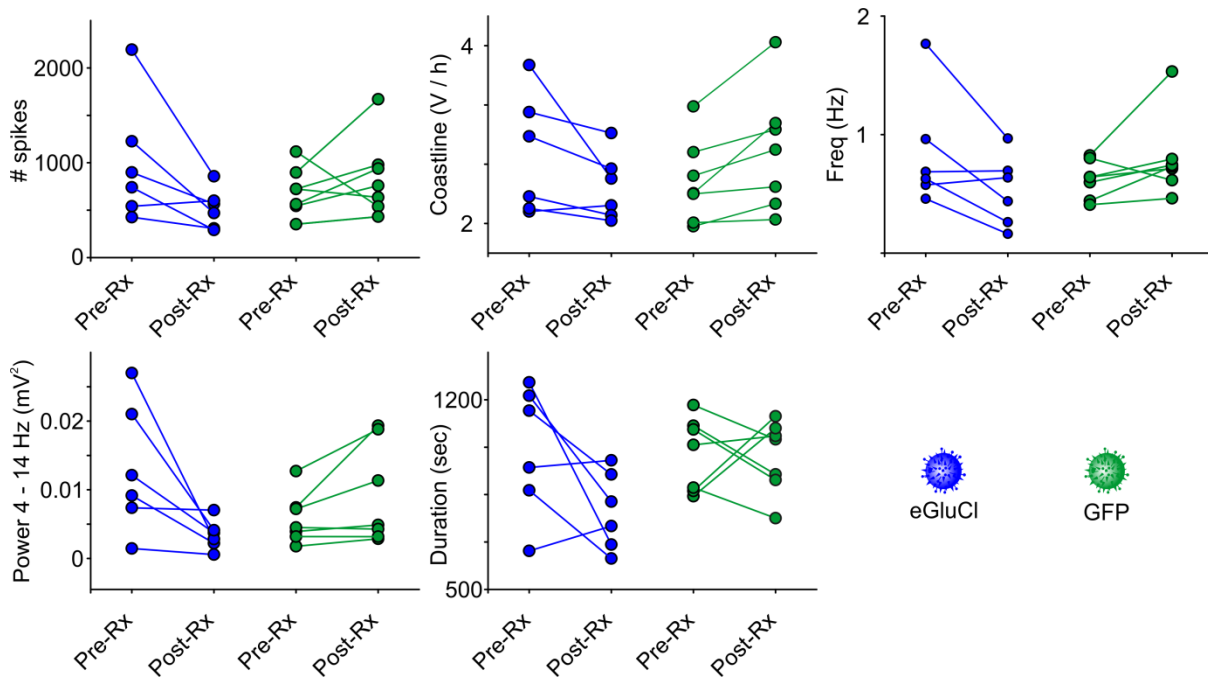


Supplementary Figure 1: Immunolabeling of eGluCl, neurofilament and DAPI.



The arrows indicate the overlap of eGluCl and neurofilament heavy polypeptide. The merged image is shown on bottom (n=1 animal). (scale bar 20 μ m)

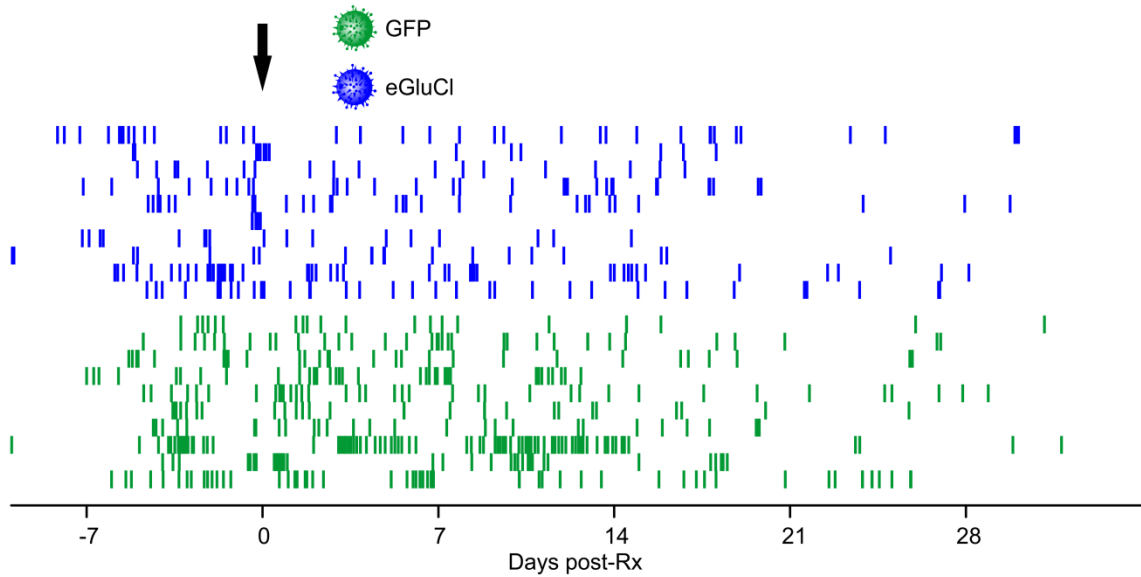
Supplementary Figure 2: Quantification of the acute chemoconvulsant-induced seizure model.



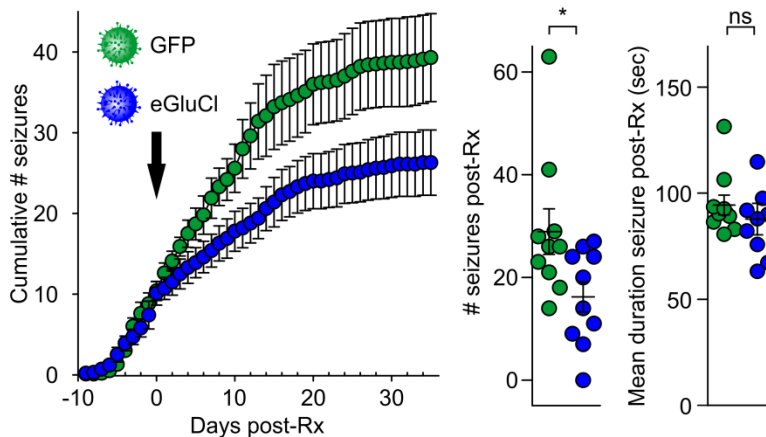
Absolute number of spikes (# spikes), coastline, spike frequency, 4-14Hz power, and seizure duration in animals injected with pilocarpine pre-Rx and post-Rx.

Supplementary Figure 3: Quantification of the model of chronic focal neocortical epilepsy.

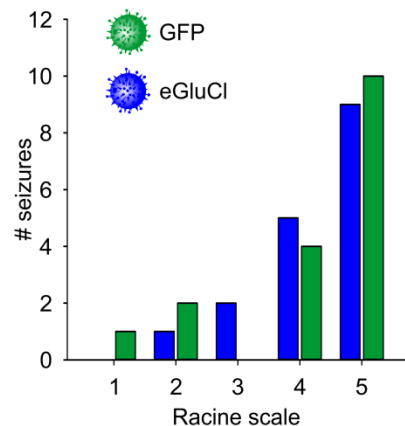
a



b

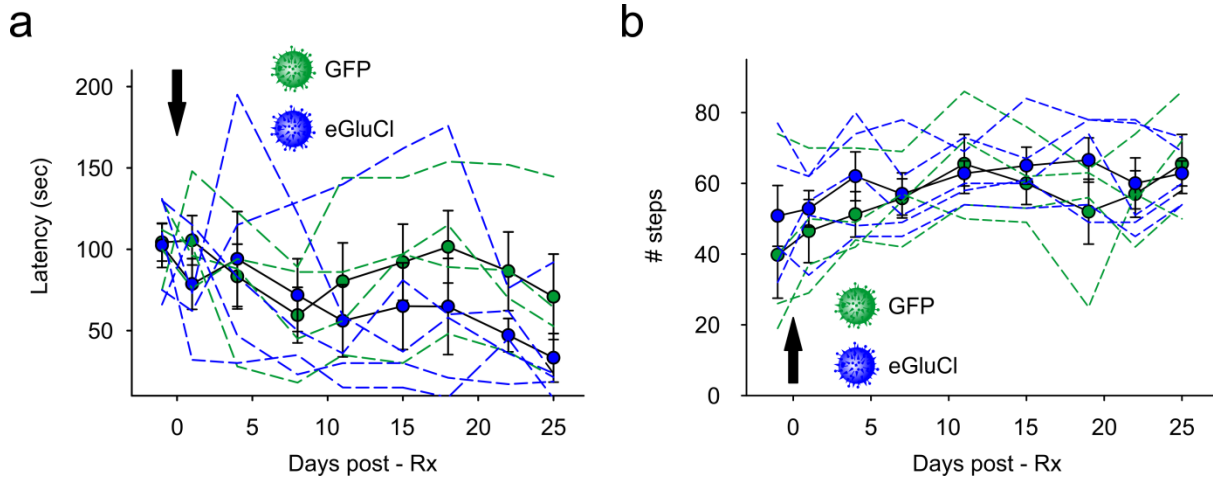


c



(a) Raster plot of seizures in all animals after TetTx injection. The arrow indicates lentivector injection. (b) Left: cumulative absolute number of seizures in animals treated with either eGluCI or GFP (mean±sem). The arrow indicates the time point of lentivector injection. Middle: absolute cumulative number of seizures for all animals post-Rx at day 35 (eGluCI: 16.2±2.9, n=10; GFP: 28.9±4.4, n=10; mean±sem, p=0.034, Mann Whitney test). *p<0.05. Right: Average seizure duration in all animals (eGluCI 85.6±53 sec, n=9; GFP 94.3±4.7 sec, n=10; mean±sem, p=0.278, Mann Whitney test; note that one eGluCI-treated animal did not experience any seizures post-Rx). (c) Racine scale for randomly selected seizures (three from each of 6 animals in each group).

Supplementary Figure 4: Long term behavioural side effect screen.



(a) Latency to fall from rotarod before and after treatment with eGluCl or GFP. The arrow indicates the timepoint of lentivector injection (mean \pm sem, two-way ANOVA, $F(1,56)=0.72$; eGluCl, $n=5$; GFP, $n=4$). The dashed lines represent individual experiments. **(b)** Absolute number of steps taken by the same animals on the elevated grid (mean \pm sem, two-way ANOVA, $F(1,56)=0.37$; eGluCl, $n=5$; GFP, $n=4$). The dashed lines represent individual experiments.