

Supplementary Figure S1. Representative microphotographs of the optic tracts in wild-type (WT) and TDP-43^{G348C} mice at six months after repetitive mild traumatic brain injury (rmTBI) or sham procedure (Sham), immunostained with anti-ionized calcium-binding adaptor molecule 1 (Iba1), showing different morphological forms of microglial cells. Arrowheads point to Iba1-positive cells with “resting” morphology, and arrows point to Iba1-positive cells with various activated forms. Scale bar: 25 μm .

Supplementary Figure S2. Fluoro-Jade C and cresyl-violet stained sections of the lateral geniculate nucleus (LGN) and the superior colliculus (SC) in wild-type (WT) and TDP-43^{G348C} mice at six months after repetitive mild traumatic brain injury (rmTBI). Representative microphotographs of the Fluoro-Jade C stained sections of (A) the LGN and (D) the SC. (A) Denoted lines indicate the LGN. (D) Arrows point to Fluoro-Jade C positive staining in the SC. Scale bar for (A) the LGN: 200 μm , and (D) the SC: 50 μm . (E) The histogram shows the intensity levels of the fluorescent staining (A.U./ μm^2) in the SC of WT and TDP-43^{G348C} mice of the control groups (Sham) and animals with rmTBI. Results are expressed as means \pm SEM (N = 4). Representative microphotographs of the cresyl-violet stained sections of (B) the LGN and (F) the SC. Scale bar: 100 μm . Histograms show the number of cresyl-violet positive neurons/ mm^2 in (C) the LGN and (G) the SC of WT and TDP-43^{G348C} mice of the control groups (Sham) and animals with rmTBI. Results are expressed as means \pm SEM (N = 3–5).

Supplementary Figure S3. The activity of the glial cells in the lateral geniculate nucleus (LGN) and the superior colliculus (SC) in wild-type (WT) and TDP-43^{G348C} mice at six months after repetitive mild traumatic brain injury (rmTBI). Representative microphotographs of the sections of (A) the LGN and (D) the SC immunostained with anti-ionized calcium-binding adaptor molecule 1 (Iba1). Arrowheads point to the “resting” microglia. Scale bar: 100 μm . Histograms show the numbers of Iba1-positive cells/ mm^2 in (B) the LGN and (E) the SC of WT and TDP-43^{G348C} mice with rmTBI and related control groups (Sham). Results are expressed as means \pm SEM (N = 3–5). Representative microphotographs of the sections (C) of the LGN and (F) the SC immunostained with anti-glial fibrillary acidic protein. Scale bar: 100 μm .

Supplementary Figure S4. Synaptic plasticity in the lateral geniculate nucleus (LGN) and the superior colliculus (SC) in wild-type (WT) and TDP-43^{G348C} mice at six months after repetitive

mild traumatic brain injury (rmTBI). Representative microphotographs of the sections of **(A)** the LGN and **(C)** the SC immunostained with anti-synaptophysin (SYP). Scale bar: 100 μm . Histograms show the SYP intensity (A.U.) in **(B)** the LGN and **(D)** the SC of WT and TDP-43^{G348C} mice with rmTBI and related control groups (Sham). Results are expressed as means \pm SEM (N = 3–4).