Supplementary material



**Supplementary Fig. 1. The co-stains of HOMER1A and cell type-specific markers (*e.g.*, IBA1 for microglia, GFAP for astrocytes, MBP for myelin sheath cells) were detected through IF assay.**



**Supplementary Fig. 2. Groups were divided into the Sham, SEV + AAV-NC, SEV + AAV-HOMER1A and SEV + AAV-HOMER1A + CC (AMPK inhibitor) group.** The Escape latency, Clutter level of path, Time in target quadrant, Number of platform crossings, Distance covered in the target quadrant were assessed through Morris water maze test. \*\**p* < 0.01, \*\*\**p* < 0.001.



**Supplementary Fig. 3.** **Molecular mechanism of HOMER1A-AMPK/TXNIP axis in SEV-stimulated cognitive dysfunction.** HOMER1A activates the AMPK/TXNIP axis to regulate microglia M1/M2 imbalance and cognitive defect in SEV-stimulated cognitive dysfunction. Groups were divided into the Sham, SEV + AAV-NC, SEV + AAV-HOMER1A and SEV + AAV-HOMER1A + CC (AMPK inhibitor) group. The M1 (Iba1+ CD16+) and M2 (Iba1+ Arg1+) cells were confirmed through flow cytometry. \*\*\**p* < 0.001.