

Supplementary Materials for

The ADCY1-mediated cAMP signaling pathway mediates functional effects of montelukast treatment in brain organoids

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The PDF file includes:

Fig. S1. Molecular docking analysis between MTK and GPCRs

Fig. S2. *ADCY1* expression patterns across 54 human tissues

Fig. S3. GABA levels after MTK exposure or *ADCY1* overexpression in hFOs

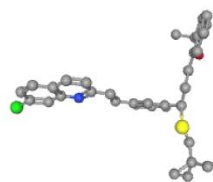
Fig. S4. *ADCY1* expression, cAMP and glutamate levels after MTK exposure in U1M hFOs

Other Supplementary Materials for this manuscript include the following:

Supplementary Table S1. DEGs between MTK-exposed and control hFOs

Supplementary Table S2. GO and KEGG pathway analysis for the MTK exposure-induced DEGs

Supplementary Table S3. Gene-disease association analysis for the MTK exposure-induced DEGs



Montelukast 3D Conformer

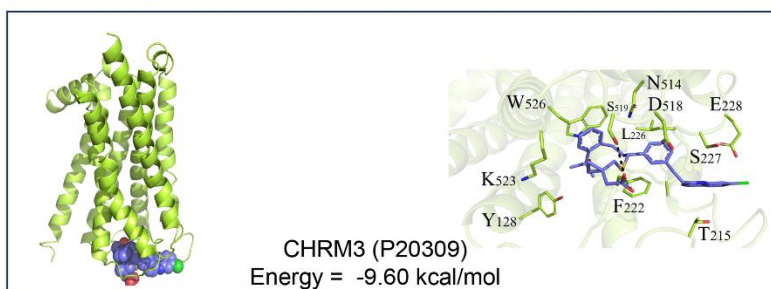
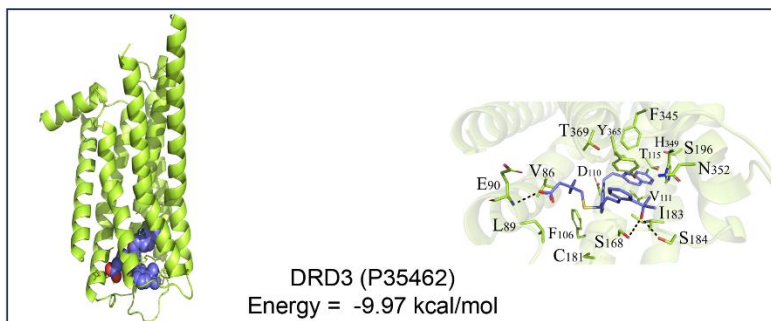
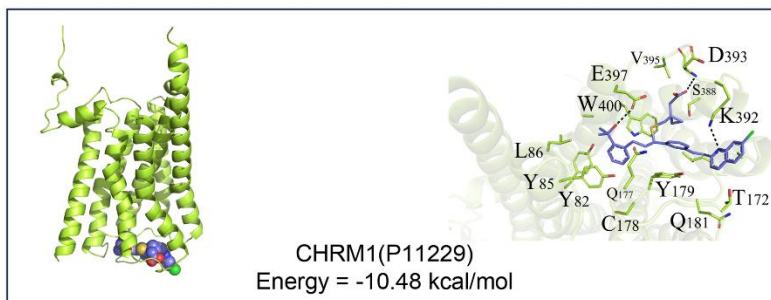
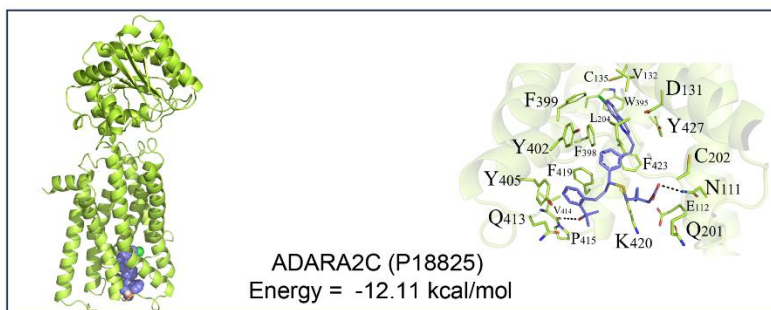


Fig. S1. Molecular docking analysis between MTK and GPCRs

Predicted binding patterns between MTK and four GPCRs (ADARA2C, CHRM1, DRD3, and CHRM3,) are shown. Binding energy less than -7 kcal/mol suggested a strong binding affinity.

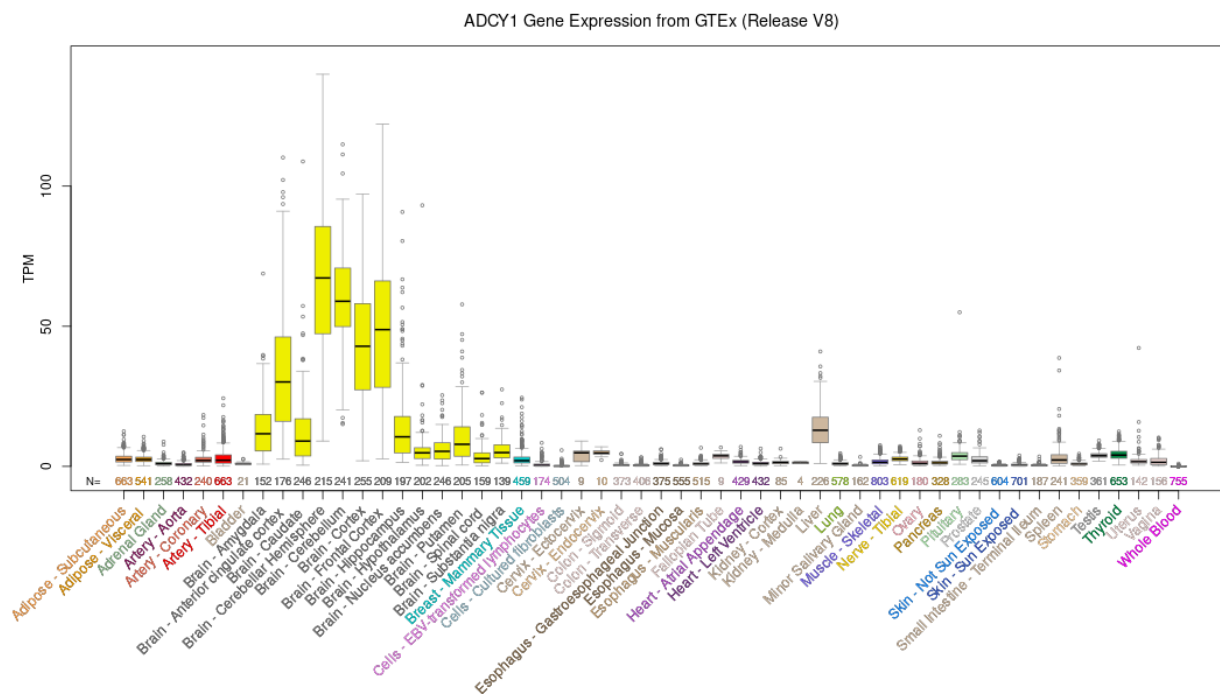


Fig. S2. ADCY1 expression patterns across 54 human tissues. Data are derived from the GTEx portal. The brain tissues are indicated in yellow bars.

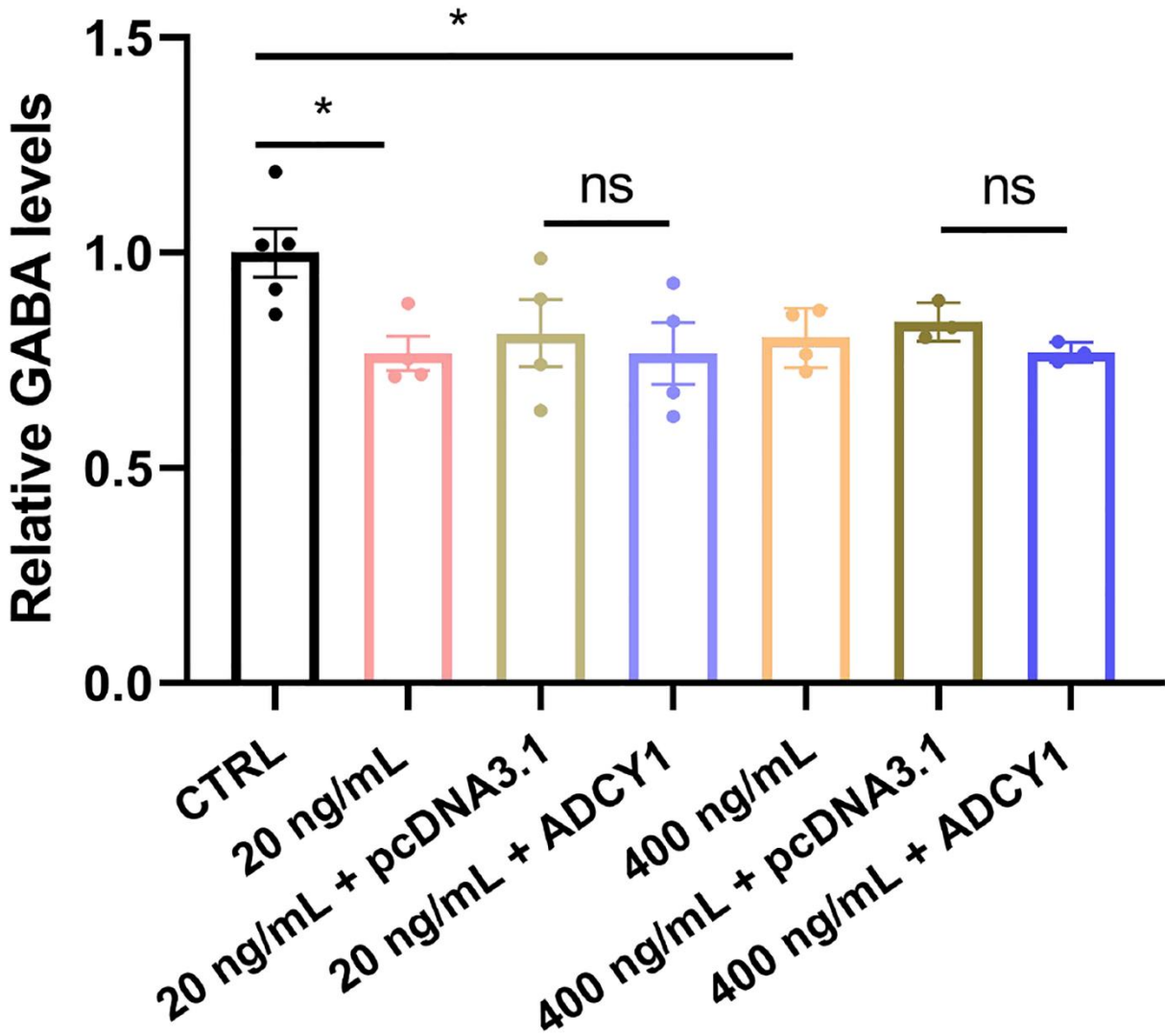


Fig. S3. GABA levels after MTK exposure or *ADCY1* overexpression in hFOs. $N \geq 3$ independent hFOs in each group for the ELISA detection for *ADCY1* protein, cAMP and glutamate levels. Data are shown as Mean $\pm$ SEM. Two-tailed t-test, $*P < 0.05$. ns, non-significance.

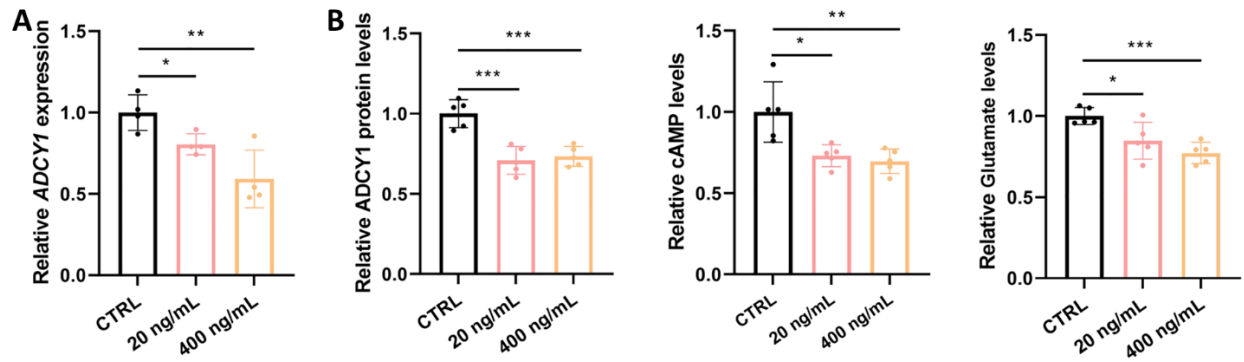


Fig. S4. *ADCY1* expression, cAMP and glutamate levels after MTK exposure in U1M hFOs. (A) $N = 4$ technical replicates per group in the RT-qPCR analysis. Data are shown as Mean $\pm$ SD. Two-tailed t-test, $*P < 0.05$, $**P < 0.01$. (B) $N \geq 3$ independent hFOs in each group for the ELISA detection for ADCY1 protein, cAMP and glutamate levels. Data are shown as Mean $\pm$ SEM. Two-tailed t-test, $*P < 0.05$, $**P < 0.01$, $***P < 0.001$.