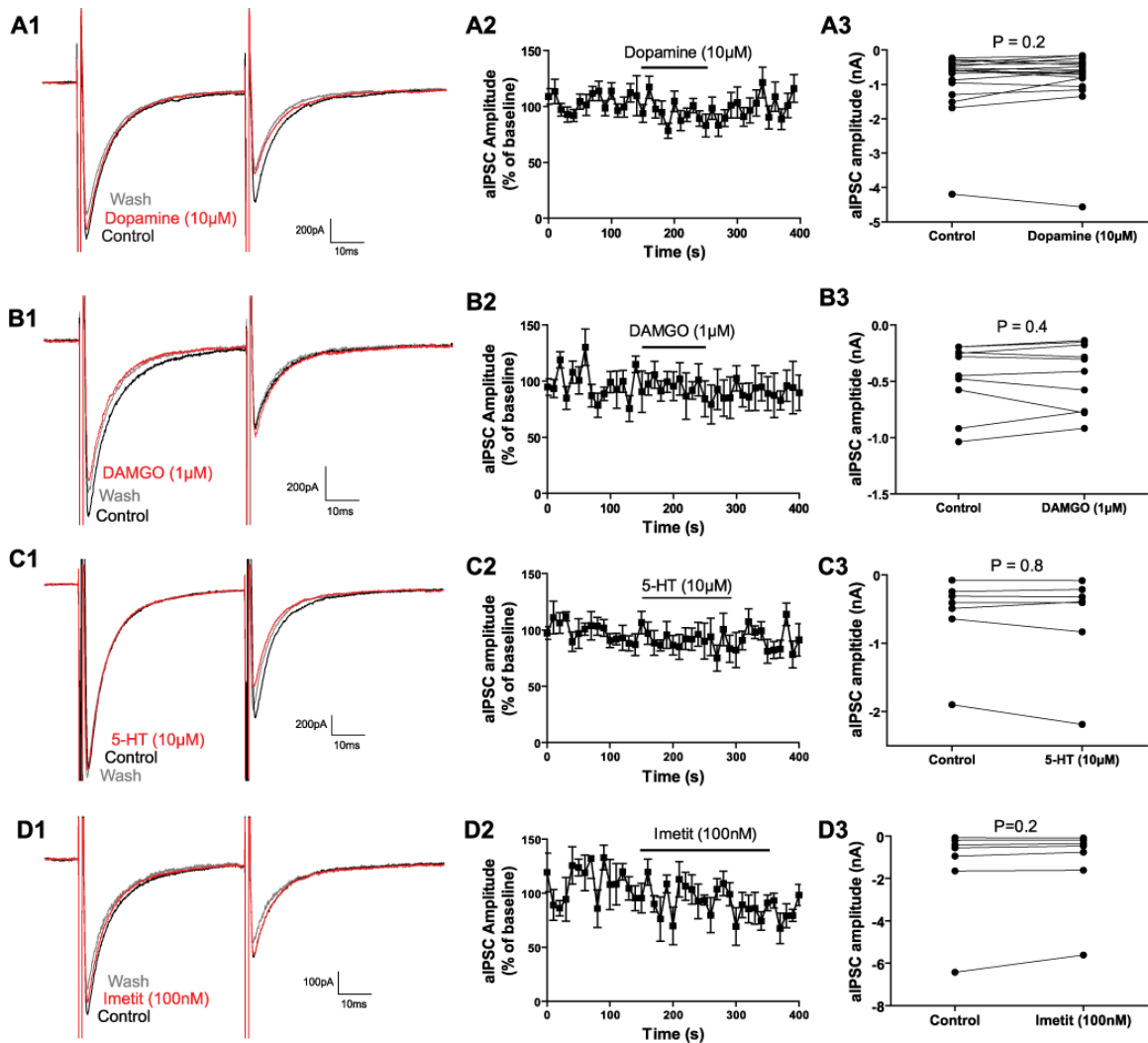


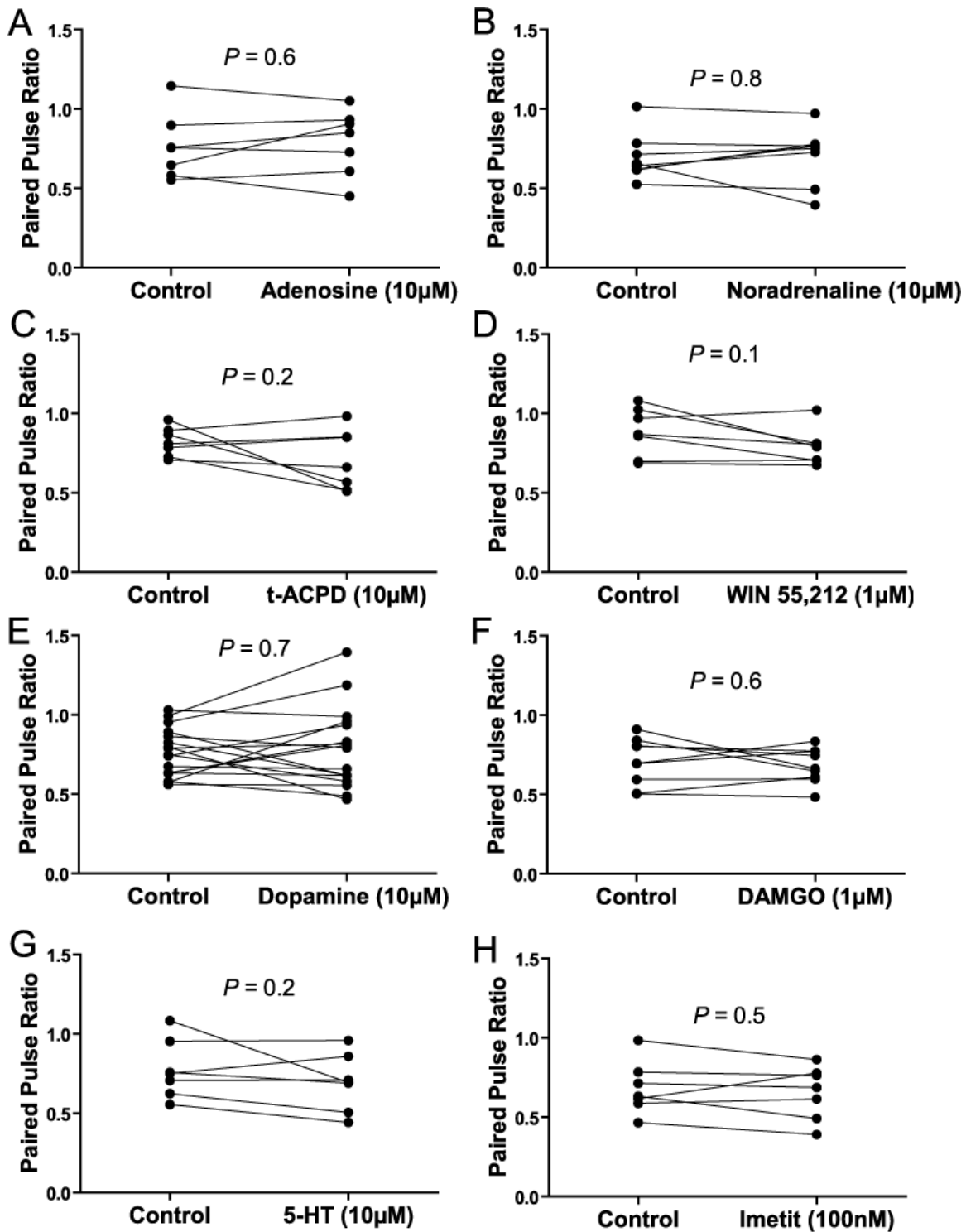
**Figure S1.** Autaptic GABA release is insensitive to adenosine, adreno-, group I and II metabotropic glutamate and cannabinoid CB1 receptor activation. **A1**, Example aIPSCs before, during and after the application of adenosine (10 μM). **A2**, The effect of adenosine on aIPSC amplitude over time (n = 6). **A3**, Adenosine does not alter the amplitude of aIPSCs (control  $503 \pm 167$  pA, adenosine  $492 \pm 185$  pA, n = 6,  $P = 0.3$ , paired student t-test). **B1**, Example aIPSCs before, during and after the application of noradrenaline (10 μM). **B2**, The effect of L-noradrenaline on aIPSC amplitude over time (n = 8). **B3**, Noradrenaline does not alter the amplitude of aIPSCs (control  $540 \pm 138$  pA, noradrenaline  $627 \pm 169$  pA, n = 8,  $P = 0.3$ , paired student t-test). **C1**, Example aIPSCs before, during and after the application of the group I and II metabotropic glutamate

receptor agonist trans-(1S,3R)-ACPD (10  $\mu$ M). **C2**, The effect of t-ACPD on aIPSC amplitude over time (n = 7). **C3**, t-ACPD does not alter the amplitude of aIPSCs (control  $761 \pm 366$  pA, t-ACPD  $798 \pm 368$  pA, n = 7,  $P = 0.2$ , paired student t-test). **D1**, Example aIPSCs before and during the application of the cannabinoid CB1 receptor agonist WIN 55,212 (1  $\mu$ M). **D2**, The effect of WIN 55,212 on aIPSC amplitude over time (n = 7). **D3**, WIN 55,212 does not alter the amplitude of aIPSCs (control  $647 \pm 173$  pA, WIN 55,212  $572 \pm 193$  pA, n = 7,  $P = 0.2$ , paired student t-test).



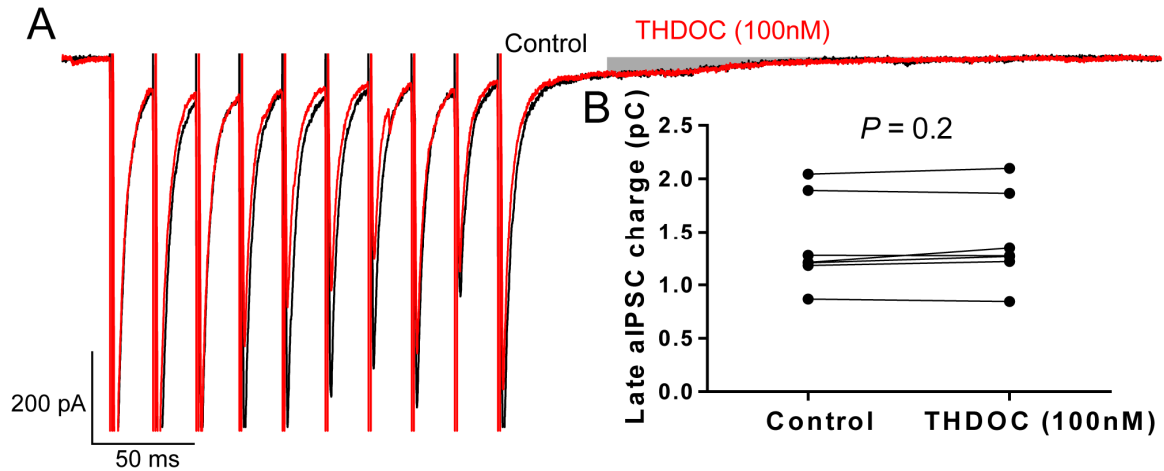
**Figure S2.** Autaptic GABA release is insensitive to dopamine,  $\mu$ -opioid, serotonin and histamine H3 receptor activation. **A1**, Example aIPSCs before, during and after the application of dopamine (10  $\mu$ M). **A2**, The effect of dopamine on aIPSC amplitude over time (n = 18). **A3**, Dopamine does not alter the amplitude of aIPSCs (control  $899 \pm 217$  pA, dopamine  $843 \pm 232$  pA, n = 18,  $P = 0.2$ , paired student t-test). **B1**, Example aIPSCs before, during and after the application of the  $\mu$ -opioid agonist DAMGO (1  $\mu$ M). **B2**, The effect of DAMGO on aIPSC amplitude over time (n = 10). **B3**, DAMGO does not alter the amplitude of aIPSCs (control  $462 \pm 95$  pA, DAMGO  $450 \pm 92$  pA, n = 10,  $P = 0.4$ , paired student t-test). **C1**, Example aIPSCs before, during and after the application of 5-

HT (10  $\mu$ M). **C2**, The effect of 5-HT on aIPSC amplitude over time (n = 7). **C3**, 5-HT does not alter the amplitude of aIPSCs (control  $581 \pm 230$  pA, 5-HT  $632 \pm 274$  pA, n = 7,  $P = 0.8$ , paired student t-test). **D1**, Example aIPSCs before, during and after the application of the histamine H3 agonist imetit (100 nM). **D2**, The effect of imetit on aIPSC amplitude over time (n = 7). **D3**, Imetit does not alter the amplitude of aIPSCs (control  $1462 \pm 851$  pA, imetit  $1294 \pm 744$  pA, n = 7,  $P = 0.2$ , paired student t-test).



**Figure S3.** Neuromodulators that do not affect aIPSC amplitude have no effect on aIPSC paired pulse ratio. **A**, Adenosine (10  $\mu$ M) has no effect on paired pulse ration (control  $0.763 \pm 0.078$ , adenosine,  $0.790 \pm 0.0784$ ,  $n = 7$ ,  $P = 0.6$ ). **B**, Noradrenaline (10  $\mu$ M) has

no effect on paired pulse ratio (control  $0.697 \pm 0.053$  noradrenaline  $0.707 \pm 0.064$ ,  $n = 8$ ,  $P = 0.8$ ). **C**, The group I/II metabotropic glutamate receptor agonist t-ACPD ( $10 \mu\text{M}$ ) has no effect of paired pulse ratio (control  $0.820 \pm 0.034$ , t-ACPD  $0.705 \pm 0.072$ ,  $n = 7$ ,  $P = 0.2$ ). **D**, The CB1 receptor agonist WIN 55,212 ( $1 \mu\text{M}$ ) has no effect on the paired pulse ratio (control  $0.88 \pm 0.058$ , WIN 55,212  $0.7868 \pm 0.044$   $n = 7$ ,  $P = 0.1$ ). **E**, Dopamine ( $10 \mu\text{M}$ ) has no effect on the paired pulse ratio (control  $0.760 \pm 0.037$ , dopamine  $0.783 \pm 0.064$ ,  $n = 18$ ,  $P = 0.7$ ). **F**, The  $\mu$ -opioid receptor agonist DAMGO ( $1 \mu\text{M}$ ) has no effect on the paired pulse ratio (control  $0.707 \pm 0.049$ , DAMGO,  $0.681 \pm 0.037$ ,  $n = 9$ ,  $P = 0.6$ ). **G**, 5-HT ( $10\mu\text{M}$ ) has no effect on the paired pulse ratio (control  $0.775 \pm 0.070$ , 5-HT  $0.693 \pm 0.069$ ,  $n = 7$ ,  $P = 0.2$ ). **H**, The H3 histamine receptor agonist imetit ( $100 \text{ nM}$ ) has no effect on the paired pulse ratio (control  $0.684 \pm 0.063$ , imetit  $0.656 \pm 0.063$ ,  $n = 7$ ,  $P = 0.5$ ) all tested with paired t-tests.



**Figure S4.** Pharmacological properties of late aIPSC. **A**, A representative trace showing the lack of effect of the  $\alpha$  subunit selective positive modulator THDOC (100 nM) on the charge transferred during the late phase of the autaptic event. **B**, THDOC has no effect on the amount of charge transferred during the late phase of the autaptic event (grey area, control  $1.4 \pm 0.2$  pC THDOC  $1.4 \pm 0.2$  pC,  $n = 7$ ,  $P = 0.2$ ).