Dataset. Statistical data.

Dataset. Statistical Data		
Figure	**Analysis**	**N**
Fig. 1A	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: Row Factor: $F_{2, 60}$=28.46, *P*<0.0001; Column Factor: $F_{2, 30}$= 2.827, *P*=0.0750; *CaMKIIα-Cre;Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: *P*=0.0516; *CaMKIIα-Cre;Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: *P*=1876; 74 dB: *CaMKIIα-Cre;Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: *P*=0.7551; *CaMKIIα-Cre;Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$: P*=0.9922; 78 dB: *CaMKIIα-Cre;Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: *P*=0.2050; *CaMKIIα-Cre;Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: *P*=3075; 82 dB: *CaMKIIα-Cre;Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: *P*=0.0006; *CaMKIIα-Cre;Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: *P*=0.0104;	n=11 mice per group;
Fig. 1B1	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: Row Factor: $F_{16, 480}$=37.52, *P<0.0001*; Column Factor: $F_{2, 30}$= 4.871, *P*=0.0147; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: *P*=0.0250; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: *P*=0.0178;	
Fig. 1B2	Two-way repeated-measures ANOVA with post hoc Dunnett's test: Row Factor: $F_{16, 480}$=16.31, *P*<0.0001; Column Factor: $F_{2, 30}$=0.5823, *P*=0.5648; *CaMKIIα-Cre; Hrh2$^{fl/fl}$* vs. *CaMKIIα-Cre*: *P*=0.6688; *CaMKIIα-Cre; Hrh2$^{fl/fl}$* vs. *Hrh2$^{fl/fl}$*: *P*=0.4827;	
Fig. 1B3	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: Row Factor: $F_{1, 60}$=13.50, *P*=0.0005; Column Factor: $F_{2, 60}$=3.859, *P*=0.0265; MK+Saline: *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: *P*=0.0745; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$: P*=0.0065; MK+Risp: *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: *P*=0.8899; *CaMKIIα-Cre;Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: *P*=6219;	

Fig. 1C2	Time in close interaction-E *vs.* S1: *CaMKIIα-Cre,* unpaired two-tailed *t* test, t=3.125, P=0.0053; $Hrh2^{fl/fl}$, unpaired two-tailed *t* test, t=3.295, P=0.0036; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$, unpaired two-tailed *t* test, t=0.6243, P=0.5395; Preference index for S1 and E: one-way ANOVA with *post hoc* Dunnett's test: $F_{2, 30}$=4.222, P=0.0242; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs. CaMKIIα-Cre*: P=0.0367; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs.* $Hrh2^{fl/fl}$: P=0.0286；	
Fig. 1C3	Time in close interaction-S1 *vs.* S2: *CaMKIIα-Cre*, unpaired two-tailed *t* test, t=3.348, P=0.0032; $Hrh2^{fl/fl}$, Mann-Whitney test, U=3, P<0.0001; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$, Mann-Whitney test, U=56, P=0.7969; Preference index for S1 and E: Kruskal-Wallis test with *post-hoc* Dunn's test: F=8.823, P=0.0121; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs. CaMKIIα-Cre*: P=0.0389; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs.* $Hrh2^{fl/fl}$: P=0.0117；	
Fig. 1D	For nesting score: one-way ANOVA with *post hoc* Dunnett's test: $F_{2, 30}$=9.640, P=0.0006; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs. CaMKIIα-Cre*: P=0.0018; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs.* $Hrh2^{fl/fl}$: P=0.0010; for unshredded cotton (% weight): Kruskal-Wallis test with *post-hoc* Dunn's test: F=12.54, P=0.0019; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs. CaMKIIα-Cre*: P=0.0021; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs.* $Hrh2^{fl/fl}$: P=0.0100;	
Fig. 1E	For total consumption: water: Two-way repeated-measures ANOVA with post hoc Dunnett's test: Row Factor: $F_{1, 30}$=0.1193, P=0.7322; Column Factor: $F_{2, 30}$=0.7092, P=0.5001; for sucrose preference: one-way ANOVA with *post hoc* Dunnett test: $F_{2,30}$=22.56; P<0.0001; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs. CaMKIIα-Cre*: P<0.0001; *CaMKIIα-Cre;* $Hrh2^{fl/fl}$ *vs.* $Hrh2^{fl/fl}$: P<0.0001;	

Fig. 1F	One-way ANOVA with *post hoc* Dunnett's test: $F_{2,30}$=11.84, *P*=0.0002; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$ *vs. CaMKIIα-Cre*: *P*<0.0001; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$ *vs. Hrh2*$^{fl/fl}$: *P*=0.0045;	
Fig. 2B2	Unpaired two-tailed *t* test, *t*=5.281, *P*=0.0062;	n=3 mice per group;
Fig. 2C	Two-way repeated-measures ANOVA with *post hoc* Sidak's test: row factor: *F*2, 54=25.51, *P*<0.0001; column factor: $F_{1, 27}$=4.366, *P*=0.0462; 74 dB: *P*=0.9971; 78 dB: *P*=0.7700; 82 dB: *P*<0.0001	n=13 *CaMKIIα-Cre+AAV-CON* mice; n=14 *CaMKIIα-cre+AAV-shHrh2*;
Fig. 2D	For distance moved per 5 mins: two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{16, 816}$=27.60, *P*<0.0001; column factor: $F_{3, 51}$=22.77, *P*<0.0001; *AAV-CON*+Saline *vs. AAV-CON*+MK-801: *P*=0.0087; *AAV-CON*+MK-801 *vs. AAV-shHrh2*+MK-801: *P*=0.0008; For total distance in th first 30 mins: two-way ANOVA with *post hoc* Tukey's test: row factor: $F_{1, 52}$=19.24, *P*<0.0001; column factor: $F_{1, 52}$=11.73, *P*=0.0012; *AAV-CON*+Saline+Saline vs. *AAV-shHrh2*+MK-801+Saline: *P*<0.0001; *AAV-shHrh2*+MK-801+Saline *vs. AAV-shHrh2*+MK-801+Risp: *P*<0.0001;	For distance moved per 5 mins, n=14 *AAV-CON*+Saline, *AAV-CON*+MK-801 and *AAV-shHrh2*+Saline mice, n=13 *AAV-shHrh2*+MK-801 mice; For total distance of *AAV-shHrh2* mice treated with risperidone or saline, n=14 mice per group.
Fig. 2E	For nesting score: unpaired two-tailed *t* test, *t*=3.018, *P*=0.0055; for unshredded cotton (% weight): Mann-Whitney test, *U*=34, *P*=0.0012;	n=13 *CaMKIIα-Cre+AAV-CON* mice; n=14 *CaMKIIα-cre+AAV-shHrh2*;
Fig. 2F	Time in close interaction-E *vs.* S1: *AAV-CON*, unpaired two-tailed *t* test, *t*=3.985, *P*=0.0005; *AAV-shHrh2*, unpaired two-tailed *t* test, *t*=1.188, *P*=0.2450; preference index for S1 and E: unpaired two-tailed *t* test, *t*=2.201, *P*=0.0365; Time in close interaction-S1 *vs.* S2: *AAV-CON*, Mann-Whitney test, *U*=28.5, *P*=0.0008; *AAV-shHrh2*, Mann-Whitney test, *U*=107, *P*=0.8381; preference index for S2 and S1: unpaired two-tailed *t* test, *t*=2.495, *P*=0.0190;	

Fig. 2G	Mann-Whitney test, U=35, P=0.0016;	
Fig. 2H	Mann-Whitney test, U=46, P=0.0091;	
Fig. 3A2	Unpaired two-tailed t test, t=4.089, P=0.0150;	n=3 mice per group;
Fig. 3D	Two-way repeated-measures ANOVA with *post hoc* Tukey's test: row factor: $F_{2, 84}$=28.05, *P<0.0001*; column factor: $F_{3, 42}$=9.412, P<0.0001; *AAV-NEG*+Saline *vs. AAV-Hrh2*+Saline: P=0.1297; *AAV-NEG*+Saline *vs. AAV-NEG*+MK-801: P<0.0001; *AAV-NEG*+MK-801 *vs. AAV-Hrh2*+MK-801: P=0.0013;	n=12 *CaMKIIα-Cre+AAV-NEG*+Saline mice, n=10 *CaMKIIα-Cre+AAV-Hrh2*+Saline mice; n=12 *CaMKIIα-Cre+AAV-NEG*+MK-801 mice, n=12 *CaMKIIα-Cre+AAV-Hrh2*+MK-801 mice;
Fig. 3E	For distance moved per 5 mins: two-way repeated-measures ANOVA with *post hoc* Tukey's test: row factor: $F_{16, 672}$=10.01, P<0.0001; column factor: $F_{3, 42}$=7.393, *P=0.0004*; *AAV-NEG*+Saline *vs. AAV-Hrh2*+Saline: P=0.9240; *AAV-NEG*+Saline *vs. AAV-NEG*+MK-801: P=0.0027; *AAV-NEG*+MK-801 *vs. AAV-Hrh2*+MK-801: P=0.0187; for total distance: two-way ANOVA with *post hoc* Tukey's test: $F_{3, 28}$=13.96; *AAV-NEG*+Saline *vs. AAV-Hrh2*+Saline: P=0.7990; *AAV-NEG*+Saline *vs. AAV-NEG*+MK-801: P<0.0001; *AAV-NEG*+MK-801 *vs. AAV-Hrh2*+MK-801: P=0.0013;	

Fig. 3F	Time in close interaction-E *vs.* S1: *AAV-NEG*+Saline, unpaired two-tailed *t* test, t=4.192, P=0.0004; *AAV-Hrh2*+Saline: Mann-Whitney test, U=21, P=0.0288; *AAV-NEG*+MK-801, unpaired two-tailed *t* test, t=0.4489, P=0.6579; *AAV-Hrh2*+MK-801, unpaired two-tailed *t* test, t=6.349, P<0.0001; Preference index for S1 and E: two-way ANOVA with *post hoc* Tukey's test: $F_{3, 29}$=6.274, P=0.0021; *AAV-NEG*+Saline *vs. AAV-Hrh2*+Saline: P=0.8240; *AAV-NEG*+Saline *vs. AAV-NEG*+MK-801: P=0.0032; *AAV-NEG*+MK-801 *vs. AAV-Hrh2*+MK-801: P=0.0061; Time in close interaction-S1 *vs.* S2: *AAV-NEG*+Saline, unpaired two-tailed *t* test, t=4.750, P<0.0001; AAV-Hrh2+Saline: unpaired two-tailed *t* test, t=4.088, P=0.0007; *AAV-NEG*+MK-801, unpaired two-tailed *t* test, t=0.7725, P=0.4480; *AAV-Hrh2*+MK-801, unpaired two-tailed *t* test, t=4.490, P=0.0002; Preference index for S2 and S1: two-way ANOVA with *post hoc* Tukey's test: $F_{3, 29}$=5.854, P=0.0030; *AAV-NEG*+Saline *vs. AAV-Hrh2*+Saline: P=0.5624; *AAV-NEG*+MK-801 *vs. AAV-NEG*+Saline: P=0.0022; *AAV-NEG*+MK-801 *vs. AAV-Hrh2*+MK-801: P=0.0241;	
Fig. 3G	For nesting score: two-way ANOVA with *post hoc* Tukey's test: $F_{3, 29}$=6.758, P=0.0014; *AAV-NEG*+Saline *vs. AAV-Hrh2*+Saline: P=0.9599; *AAV-NEG*+MK-801 *vs. AAV-NEG*+Saline: P=0.0051; *AAV-NEG*+MK-801 *vs. AAV-Hrh2*+MK-801: P=0.0109; for unshredded cotton (% weight): two-way ANOVA with *post hoc* Tukey's test: $F_{3, 29}$=5.347, P=0.0047; *AAV-NEG*+Saline *vs. AAV-Hrh2*+Saline: P=0.9861; *AAV-NEG*+MK-801 *vs. AAV-NEG*+Saline: P=0.0313; *AAV-NEG*+MK-801 *vs. AAV-Hrh2*+MK-801: P=0.0076;	

Fig. 3H	For total consumption: water: Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: Row Factor: $F_{1, 42}$=16.28, P=0.0002; Column Factor: $F_{3, 42}$=2.539, P=0.0694; for sucrose preference: two-way ANOVA with *post hoc* Tukey's test: $F_{3, 29}$=13.72, P<0.0001; *AAV-NEG*+Saline *vs. AAV-Hrh2*+Saline: P=0.9695; *AAV-NEG*+MK-801 *vs. AAV-NEG*+Saline: P<0.0001; *AAV-NEG*+MK-801 *vs. AAV-Hrh2*+MK-801: P=0.0062;	
Fig. 3I	Two-way ANOVA with *post hoc* Tukey's test: $F_{3, 27}$=9.864, P=0.0001; *AAV-NEG*+Saline vs. *AAV-Hrh2*+Saline: P=0.2698; *AAV-NEG*+MK-801 *vs. AAV-NEG*+Saline: P=0.0043; *AAV-NEG*+MK-801 *vs. AAV-Hrh2*+MK-801: P=0.0043;	
Fig. 4B1	Mann-Whitney test, U=41, P<0.0001;	n=29 cells from 3 *Hrh2*$^{fl/fl}$ mice, n=23 cells from 3 *CaMKIIα-Cre; Hrh2*$^{fl/fl}$ mice;
Fig. 4B2	For burst per minute: unpaired two-tailed *t* test, t=8.493, P<0.0001; for % of spikes in bursts, Mann-Whitney test, U=192, P=0.0086;	
Fig. 4D	Mann-Whitney test, U=366, P=0.1245;	n=29 cells from 5 *CaMKIIα-Cre+ AAV-CON* mice, n=32 cells from 6 *CaMKIIα-Cre+AAV-shHrh2* mice;
Fig. 4E	Unpaired two-tailed *t* test, t=0.4035, P=0.6881;	
Fig. 4F	Unpaired two-tailed *t* test, t=0.1704, P=0.8653;	
Fig. 4H	Two-way repeated measures ANOVA with *post hoc* Sidak's test: row factor: $F_{10, 590}$=142.1, P<0.0001; column factor: $F_{1, 59}$=6.490, P=0.0135;	
Fig. 5B1	Unpaired two-tailed *t* test, t=2.792, P=0.0070;	
Fig. 5B2	Two-way repeated measures ANOVA with *post hoc* Sidak's test: row factor: $F_{7, 413}$=135.2, P<0.0001; column factor: $F_{1, 59}$=5.325, P=0.0246;	
Fig. 5C	Two-way repeated-measures ANOVA with *post hoc* Tukey's test: row factor: $F_{10, 300}$=94.66, P<0.0001; column factor: $F_{3, 30}$=4.759, P=0.0079; *AAV-CON vs. AAV-CON*+ZD7288: P=0.8049; *AAV-CON vs. AAV-shHrh2*: P=0.0089; *AAV-*	n=7 cells from four *CaMKIIα-Cre+AAV-CON* mice, n=10 cells from five *CaMKIIα-Cre+AAV-shHrh2* mice.

	shHrh2 vs. AAV-shHrh2+ZD7288: *P*=0.0422;	
Fig. 5E	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{1.943, 46.64}$=41.84, *P*<0.0001; column factor: $F_{2, 24}$=1.419, *P*=0.2616; 74 dB: *AAV-CON*+Saline vs. *AAV-shHrh2*+Saline: *P*=0.6120; *AAV-shHrh2*+ZD7288 *vs. AAV-shHrh2*+Saline: *P*=0.8468; 78 dB: *AAV-CON*+Saline *vs. AAV-shHrh2*+Saline: *P*=0.5760; *AAV-shHrh2*+ZD7288 *vs. AAV-shHrh2*+Saline: *P*=0.6466; 82 dB: *AAV-CON*+Saline *vs. AAV-shHrh2*+Saline: *P*=0.0092; *AAV-shHrh2*+ZD7288 *vs. AAV-shHrh2*+Saline: *P*=0.0409;	n=9 mice per group;
Fig. 5F	For distance moved per 5 mins: two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{16, 384}$=22.03, *P*<0.0001; column factor: $F_{2, 24}$=17.03, *P*<0.0001; *AAV-CON*+Saline *vs. AAV-shHrh2*+Saline: *P*<0.0001; *AAV-shHrh2*+ZD7288 *vs. AAV-shHrh2*+Saline: *P*=0.0160; for total distance: one-way ANOVA with *post hoc* Dunnett test: $F_{2,24}$=17.26, *P*<0.0001; *AAV-CON*+Saline *vs. AAV-shHrh2*+Saline: *P*<0.0001; *AAV-shHrh2*+ZD7288 *vs. AAV-shHrh2*+Saline: *P*=0.0185;	

Fig. 5G	Time in close interaction-E *vs.* S1: *AAV-CON*+Sa: unpaired two-tailed *t* test, t=3.430, P=0.0034; *AAV-shHrh2*+Saline: Mann-Whitney test, U=27, P=0.2581; *AAV+shHrh2*+ZD7288: Mann-Whitney test, U=3, P=0.0003; preference index for S1 and E: one-way ANOVA with *post hoc* Dunnett test: $F_{2,24}$=5.046, P=0.0148; *AAV-CON*+Saline *vs. AAV-shHrh2*+Saline: P=0.0194; *AAV-shHrh2*+ZD7288 *vs. AAV-shHrh2*+Saline: P=0.0222; time in close interaction-S1 *vs.* S2: *AAV-CON*+Sa: Mann-Whitney test, U=6, P=0.0012; *AAV+shHrh2*+Saline: Mann-Whitney test, U=33, P=0.5457; *AAV+shHrh2*+ZD7288: unpaired two-tailed *t* test, t=3.334, P=0.0042; preference index for S2 and S1: one-way ANOVA with *post hoc* Dunnett test: $F_{2,24}$=11.36, P=0.0003; *AAV-CON*+Saline vs. *AAV-shHrh2*+Saline: P=0.0005; *AAV-shHrh2*+ZD7288 *vs. AAV-shHrh2*+Saline: P=0.0013;	
Fig. 6B	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{2, 56}$=24.78, P<0.0001; column factor: $F_{3, 28}$=4.527, P=0.0104; MK801-Veh *vs.* Saline-Veh: P=0.0099; MK801-Veh *vs.* MK-801-Amthamine: P=0.0431; WT+MK801-Veh *vs.* WT+MK-801-Batazole: P=0.0110;	n=8 mice per group;
Fig. 6C	For distance moved per 5 mins: two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{22, 616}$=27.09, P<0.0001; column factor: $F_{3, 28}$=17.53, P<0.0001; MK801-Veh *vs.* Saline-Veh: P<0.0001; MK801-Veh *vs.* MK-801-Amthamine: P=0.0003; WT+MK801-Veh *vs.* WT+MK-801-Batazole: P=0.0070; for total distance: two-way ANOVA with *post hoc* Dunnett test: $F_{3, 21}$=15.30, P<0.0001; MK801-Veh *vs.* Saline-Veh: P<0.0001; MK801-Veh *vs.* MK-801-Amthamine:	

	P=0.0011; WT+MK801-Veh *vs.* WT+MK-801-Batazole: *P*=0.0146;	
Fig. 6D	Time in close interaction-E *vs.* S1: Saline-Veh, Mann-Whitney test, *U*=0, *P*=0.0002; MK-801-Veh, Mann-Whitney test, *U*=21.50, *P*=0.2909; MK-801-Amthamine, Mann-Whitney test, *U*=1, *P*=0.0003; MK-801-Betazole, unpaired two-tailed *t* test, *t*=6.290, *P*<0.0001; preference index for S1 and E: one-way ANOVA with *post hoc* Dunnett test: $F_{3, 28}$= 8.565, *P*=0.0003; MK801-Veh *vs.* Saline-Veh: *P*=0.0638; MK801-Veh *vs.* MK-801-Amthamine: *P*=0.0011; WT+MK801-Veh *vs.* WT+MK-801-Batazole: *P*=0.0002; time in close interaction-S1 *vs.* S2: Saline-Veh, Mann-Whitney test, *U*=4.500, *P*=0.0025; MK-801-Veh, unpaired two-tailed *t* test, *t*=1.136, *P*=0.2749; MK-801-Amthamine, Mann-Whitney test, *U*=0, *P*=0.0002; MK-801-Betazole, Mann-Whitney test, *U*=9.500, *P*=0.0160; preference index for S2 and S1: one-way ANOVA with *post hoc* Dunnett test: $F_{3, 28}$= 10.52, P<0.0001; MK801-Veh *vs.* Saline-Veh: *P*=0.0004; MK801-Veh *vs.* MK-801-Amthamine: *P*<0.0001; WT+MK801-Veh *vs.* WT+MK-801-Batazole: *P*=0.0054;	
Fig. 6E	For nesting score: one-way ANOVA with *post hoc* Dunnett test: $F_{3, 28}$=4.268, *P*=0.0133; MK801-Veh *vs.* Saline-Veh: *P*=0.0183; MK801-Veh *vs.* MK-801-Amthamine: *P*=0.0183; WT+MK801-Veh *vs.* WT+MK-801-Batazole: *P*=0.0183; for unshredded cotton (% weight): one-way ANOVA with *post hoc* Dunnett test: $F_{3, 28}$= 5.314,	

	P=0.0050; MK801-Veh *vs.* Saline-Veh: P=0.0069; MK801-Veh *vs.* MK-801-Amthamine: P=0.0038; WT+MK801-Veh *vs.* WT+MK-801-Batazole: P=0.0407;	
Fig. 6F	For total consumption: water: Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: Row Factor: $F_{1, 28}$=0.1659, P=0.6868; Column Factor: $F_{3, 28}$=3.191, P=0.0389; MK801-Veh *vs.* Saline-Veh: P=0.0295; MK801-Veh *vs.* MK-801-Amthamine: P=0.1401; WT+MK801-Veh *vs.* WT+MK-801-Batazole: P=0.0493; for sucrose preference: one-way ANOVA with *post hoc* Dunnett test: $F_{3,28}$=11.17, P<0.0001; MK801-Veh *vs.* Saline-Veh: P<0.0001; MK801-Veh *vs.* MK-801-Amthamine: P=0.0007; WT+MK801-Veh *vs.* WT+MK-801-Batazole: P=0.0094;	
Fig. 6G	One-way ANOVA with *post hoc* Dunnett's test: $F_{3, 28}$=11.83, P<0.0001; MK801-Veh *vs.* Saline-Veh: P=0.0001; MK801-Veh *vs.* MK-801-Amthamine: P=0.9526; WT+MK801-Veh *vs.* WT+MK-801-Batazole: P=0.1198;	
Fig. 6H	Kruskal-Wallis test with *post-hoc* Dunn's test: F=1.597; MK801 *vs.* Saline: P=0.4198; MK801 *vs.* MK-801+Amthamine: P>0.9999;	n=24 cells from four WT+saline mice, n=22 cells from six WT+MK-801 mice, n=18 cells from five WT+saline+amthamine mice;
Fig. 6I	One-way ANOVA with *post hoc* Dunnett test: $F_{2,61}$=0.1117, P=0.8945, MK801 *vs.* Saline: P=0.9860; MK801 *vs.* MK-801+Amthamine: P=0.9255;	
Fig. 6J	Kruskal-Wallis test with *post-hoc* Dunn's test: F=0.5300, MK801 *vs.* Saline: P>0.9999; MK801 *vs.* MK-801+Amthamine: P=0.9819;	
Fig. 6L	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{7, 427}$=317.0, P<0.0001; column factor: $F_{2, 61}$=3.737, P=0.0294; MK801 *vs.*	

	Saline: P=0.0397; MK801 *vs.* MK-801+Amthamine: P=0.0414;	
Fig. 6N1	One-way ANOVA with *post hoc* Dunnett's test: $F_{2, 61}$= 8.036, P=0.0008; MK801 *vs.* Saline: P=0.0031; MK801 *vs.* MK-801+Amthamine: P=0.0013;	
Fig. 6N2	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{7, 427}$=231.9, P<0.0001; column factor: $F_{2, 61}$=5.032, P=0.0095; MK801 *vs.* Saline: P=0.0439; MK801 *vs.* MK-801+Amthamine: P=0.0072;	
Fig. S1B	For *Hrh2* mRNA expression in Glutamate$^+$ cells: unpaired two-tailed t test: t=3.519, P=0.0025; for Glutamate intensity, Mann-Whitney test, U=45, t=0.7394; for soma size: unpaired two-tailed t test: t=0.3126, P=0.7582;	n=10 for controls and schizophrenia patients;
Fig. S2C	Unpaired two-tailed t test, t=13.00, P=0.0002;	n=3 mice per group;
Fig. S2D	One-way ANOVA with post hoc Dunnett's test: $F_{2, 30}$=1.820, P=0.1794; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: P=0.3096; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: P=0.1334;	n=11 mice per group;
Fig. S2E	One-way ANOVA with *post hoc* Dunnett's test: $F_{2, 30}$=0.09785, P=0.9071; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: P=0.9110; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: P=0.9985;	
Fig. S2F	Kruskal-Wallis test with *post-hoc* Dunn's test: F=0.4501, *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: P>0.9999; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: P>0.9999;	
Fig. S2G	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{4, 120}$=195.7, P<0.0001; column factor: $F_{2, 30}$=0.6229, P=0.5432; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: P=0.5460; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: P=0.5179;	

Fig. S2H	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{7, 210}$=54.87, P<0.0001; column factor: $F_{2, 30}$=0.1944, P=0.8244; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. CaMKIIα-Cre*: P=0.7617; *CaMKIIα-Cre; Hrh2$^{fl/fl}$ vs. Hrh2$^{fl/fl}$*: P=0.9539;	
Fig. S3A	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{1.592, 47.76}$=28.46, P<0.0001; column factor: $F_{2, 30}$=2.827, P=0.0750; *CaMKIIα-Cre*: 78dB *vs.* 74dB: P=0.0477; 82dB *vs.* 78dB: P=0.0073; *Hrh2$^{fl/fl}$*: 78dB *vs.* 74dB: P=0.0040; 82dB *vs.* 78dB: P=0.0749; *CaMKIIα-Cre; Hrh2$^{fl/fl}$*: 78dB *vs.* 74dB: P=0.6564; 82dB *vs.* 78dB: P=0.6492;	n=11 mice per group;
Fig. S3B	Two-way repeated-measures ANOVA with *post hoc* Sidak's test: row factor: $F_{2, 54}$=25.51, P<0.0001; column factor: $F_{1, 27}$=4.366, P=0.0462; *AAV-CON*: 78dB *vs.* 74dB: P=0.0038; 82dB *vs.* 78dB: P<0.0001; *AAV-shHrh2*: 78dB *vs.* 74dB: P=0.1316; 82dB *vs.* 78dB: P=0.9973;	n=13 *CaMKIIα-Cre+AAV-CON* mice; n=14 *CaMKIIα-cre+AAV-shHrh2*;
Fig. S3C	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{2, 60}$=2.279, P=0.1112; column factor: $F_{2, 30}$=0.3757, P=0.6900;	n=11 mice per group;
Fig. S3D	Two-way repeated-measures ANOVA with *post hoc* Sidak's test: row factor: $F_{2, 54}$=5.536, P=0.0065; column factor: $F_{1, 27}$=0.01885, P=0.8918;	n=13 *CaMKIIα-Cre+AAV-CON* mice; n=14 *CaMKIIα-cre+AAV-shHrh2*;
Fig. S4A	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{2, 80}$=31.37, P<0.0001; column factor: $F_{3, 40}$=1.644, P=0.1945; *Hrh2$^{fl/fl}$*+Saline *vs. CaMKIIα-Cre; Hrh2$^{fl/fl}$*+Saline: P=0.1302; *CaMKIIα-Cre; Hrh2$^{fl/fl}$*+Risp *vs. CaMKIIα-Cre; Hrh2$^{fl/fl}$*+Saline: P=0.2021; 74dB: *Hrh2$^{fl/fl}$*+Saline vs. *CaMKIIα-Cre; Hrh2$^{fl/fl}$*+Saline: P=0.8132; *CaMKIIα-Cre;Hrh2$^{fl/fl}$*+Risp *vs. CaMKIIα-Cre; Hrh2$^{fl/fl}$*+Saline: P=0.9373; 78dB: *Hrh2$^{fl/fl}$*+Saline vs. *CaMKIIα-Cre; Hrh2$^{fl/fl}$*+Saline:	n=11 mice per group;

	P=0.5589; *CaMKIIα-Cre;Hrh2*$^{fl/fl}$+Risp vs. *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.5322; 82dB: *Hrh2*$^{fl/fl}$+Saline vs. *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0014; *CaMKIIα-Cre;Hrh2*$^{fl/fl}$+Risp vs. *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0053;	
Fig. S4B	Two-way ANOVA with *post hoc* Dunnett's test: row factor: $F_{13, 27}$=1.044, P=0.4421; column factor: $F_{3, 27}$=8.206, P=0.0005; *Hrh2*$^{fl/fl}$+Saline *vs. CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0003; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Risp *vs. CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0058;	
Fig. S4C	For nesting score: two-way ANOVA with *post hoc* Dunnett's test: $F_{3, 29}$=3.779, P=0.0210; *Hrh2*$^{fl/fl}$+Saline *vs. CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0231; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Risp *vs. CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.2241; For unshredded cotton: two-way ANOVA with *post hoc* Dunnett's test: $F_{3, 29}$=4.693, P=0.0086; *Hrh2*$^{fl/fl}$+Saline vs. *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0090; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Risp vs. *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.4473;	

Fig. S4D	Time in close interaction-E *vs.* S1: *Hrh2*$^{fl/fl}$+Saline, unpaired two-tailed *t* test, t=5.975, P<0.0001; *Hrh2*$^{fl/fl}$+Risp: t=5.464, P<0.0001; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: unpaired two-tailed *t* test, t=0.9005, P=0.3786; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Risp, unpaired two-tailed *t* test, t=4.468, P=0.0002; Preference index for S1 and E: two-way ANOVA with *post hoc* Dunnett's test: $F_{3, 26}$=4.732, P=0.0092; *Hrh2*$^{fl/fl}$+Saline *vs.* *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0032; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Risp *vs. CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0418; Time in close interaction-S1 *vs.* S2: *Hrh2*$^{fl/fl}$+Saline, unpaired two-tailed *t* test, t=3.690, P=0.0014; *Hrh2*$^{fl/fl}$+Risp: t=5.098, P<0.0001; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: unpaired two-tailed *t* test, t=0.9781, P=0.3397; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Risp, unpaired two-tailed *t* test, t=3.198, P=0.0045; Preference index for S2 and S1: two-way ANOVA with *post hoc* Dunnett's test: $F_{3, 29}$=8.403, P=0.0004; *Hrh2*$^{fl/fl}$+Saline *vs.* *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0003; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Risp *vs. CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0014;	
Fig. S4E	Two-way ANOVA with *post hoc* Dunnett's test: $F_{3, 29}$=7.327, P=0.0008; *Hrh2*$^{fl/fl}$+Saline vs. *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0024; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Risp *vs. CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline: P=0.0111;	
Fig. S5A	Time in chambers-Left *vs.* Right: *CaMKIIα-Cre*, unpaired two-tailed *t* test, t=0.6524, P=0.5216; *Hrh2*$^{fl/fl}$, unpaired two-tailed *t* test, t=0.6079, P=0.5501; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$, Mann-Whitney test, U=56, P=0.7969;	n=11 mice per group;

Fig. S5B	One-way ANOVA with *post hoc* Dunnett's test: $F_{2, 30}$=8.319, *P*=0.0013; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$ *vs. CaMKIIα-Cre*: *P*=0.0104; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$ *vs. Hrh2*$^{fl/fl}$: *P*=0.0010;	
Fig. S5C	Time in chambers-Left *vs.* Right: *Hrh2*$^{fl/fl}$+Saline*,* unpaired two-tailed *t* test, *t*=0.1535, *P*=0.8795; *Hrh2*$^{fl/fl}$+Risp: Mann-Whitney test, *U*=40, *P*=0.1932; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Saline*:* unpaired two-tailed *t* test, *t*=0.6438, *P*=0.5270; *CaMKIIα-Cre; Hrh2*$^{fl/fl}$+Risp, Mann-Whitney test, *U*=48, *P*=0.4385;	
Fig. S5D	Time in chambers-Left *vs.* Right: *AAV-CON*+Saline, Mann-Whitney test, *U*=79, *P*=0.7909; *AAV-shHrh2*+Saline, Mann-Whitney test, *U*=88, *P*=0.6673;	n=13 *CaMKIIα-Cre+AAV-CON* mice; n=14 *CaMKIIα-cre+AAV-shHrh2*;
Fig. S5E	Time in chambers-Left *vs.* Right: *AAV-CON*+Saline, Mann-Whitney test, *U*=28, *P*=0.7209; *AAV-shHrh2*+Saline, unpaired two-tailed *t* test, *t*=1.959, *P*=0.0704; *AAV-shHrh2*+Risp, unpaired two-tailed *t* test, *t*=1.833, *P*=0.0881;	n=8 mice per group;
Fig. S5F	Time in chambers-Left *vs.* Right: *AAV-CON*, unpaired two-tailed *t* test, *t*=1.231, *P*=0.2387; *AAV-shHrh2*, unpaired two-tailed *t* test, *t*=0.03677, *P*=0.9712;	n=8 mice per group;
Fig. S5G	Time in chambers-Left *vs.* Right: *AAV-NEG*+Saline, Mann-Whitney test, *U*=64, *P*=0.6707; *AAV-Hrh2*+Saline, unpaired two-tailed *t* test, *t*=1.091, *P*=0.2897; *AAV-NEG*+MK-801, unpaired two-tailed *t* test, *t*=0.02153, *P*=0.9830; *AAV-Hrh2*+MK-801, unpaired two-tailed *t* test, *t*=0.1976, *P*=0.8459;	n=12 *CaMKIIα-Cre+AAV-NEG*+Saline mice, n=10 *CaMKIIα-Cre*+AAV-Hrh2+Saline mice; n=12 *CaMKIIα-Cre+AAV-NEG*+MK-801 mice, n=12 *CaMKIIα-Cre+AAV-Hrh2*+MK-801 mice;
Fig. S5H	Time in chambers-Left *vs.* Right: *AAV-CON*+Saline, Mann-Whitney test, *U*=26, *P*=0.2224; *AAV-shHrh2*+Saline, unpaired two-tailed *t* test, *t*=1.621, *P*=0.1246; *AAV-shHrh2*+ZD7288, Mann-Whitney test, *U*=40, *P*>0.9999;	n=8 mice per group;

Fig. S5I	Time in chambers-Left *vs.* Right: Saline-Veh, unpaired two-tailed *t* test, t=0.8483, P=0.4106; MK-801-Veh, unpaired two-tailed *t* test, t=1.045, P=0.3139; MK-801-Amthamine, unpaired two-tailed *t* test, t=0.2566, P=0.8012; MK-801-Betazole, unpaired two-tailed *t* test, t=0.3049, P=0.7649;	n=8 mice per group;
Fig. S6A	Two-way repeated-measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{2, 42}$=31.72, P<0.0001; column factor: $F_{2, 21}$=4.443, P=0.0246; 74dB: *AAV-shHrh2*+Saline *vs. AAV-CON*+Saline: P=0.6185; *AAV-shHrh2*+Saline *vs. AAV-shHrh2*+Risp: P=0.9006; 78dB: *AAV-shHrh2*+Saline vs. *AAV-CON*+Saline: P=0.4900; *AAV-shHrh2*+Saline *vs. AAV-shHrh2*+Risp: P=0.1546; 82dB: *AAV-shHrh2*+Saline *vs. AAV-CON*+Saline: P=0.0002; *AAV-shHrh2*+Saline *vs. AAV-shHrh2*+Risp: P=0.0181;	n=8 mice per group;
Fig. S6B	One-way ANOVA with *post hoc* Dunnett's test: $F_{2, 21}$=11.12, P=0.0005; *AAV-shHrh2*+Saline *vs. AAV-CO*N+Saline: P=0.0004; *AAV-shHrh2*+Saline *vs. AAV-shHrh2*+Risp: P=0.0045;	
Fig. S6C	For nesting score: one-way ANOVA with *post hoc* Dunnett's test: $F_{2, 21}$=3.063, P=0.0681; *AAV-shHrh2*+Saline *vs. AAV-CON*+Saline: P=0.0422; *AAV-shHrh2*+Saline *vs. AAV-shHrh2*+Risp: P=0.6372; For unshredded cotton: one-way ANOVA with *post hoc* Dunnett's test: $F_{3, 21}$=3.171, P=0.0626; *AAV-shHrh2*+Saline *vs. AAV-CON*+Saline: P=0.0372; *AAV-shHrh*2+Saline *vs. AAV-shHrh2*+Risp: P=0.2918;	

Fig. S6D	Time in close interaction-E *vs.* S1: *AAV-CON+Saline,* unpaired two-tailed *t* test, t=3.050, P=0.0087; *AAV-shHrh2*+Saline*:* unpaired two-tailed *t* test, t=0.5109, P=0.6174; *AAV-shHrh2*+Risp, unpaired two-tailed *t* test, t=4.697, P=0.0003; Preference index for S1 and E: one-way ANOVA with *post hoc* Dunnett's test: $F_{2, 21}$=4.796, P=0.0192; *AAV-shHrh2*+Saline *vs. AAV-CON*+Saline: P=0.0248; *AAV-shHrh2*+Saline *vs. AAV-shHrh2*+Risp: P=0.0270; Time in close interaction-S1 *vs.* S2: *AAV-CON*+Saline, unpaired two-tailed *t* test, t=3.606, P=0.0029; *AAV-shHrh2*+Saline: unpaired two-tailed *t* test, t=1.036, P=0.3180; *AAV-shHrh2*+Risp, unpaired two-tailed *t* test, t=3.552, P=0.0032; Preference index for S2 and S1: one-way ANOVA with *post hoc* Dunnett's test: $F_{2, 21}$=7.220, P=0.0041; *AAV-shHrh2*+Saline *vs. AAV-CON*+Saline: P=0.0022; *AAV-shHrh2*+Saline *vs. AAV-shHrh2*+Risp: P=0.0475;	
Fig. S6E	One-way ANOVA with *post hoc* Dunnett's test: $F_{2, 21}$=15.02, P<0.0001; *AAV-shHrh2*+Saline *vs. AAV-CON*+Saline: P=0.0009; *AAV-shHrh2*+Saline *vs. AAV-shHrh2*+Risp: P<0.0001;	
Fig. S7B2	Unpaired two-tailed *t* test, t=8.948, P=0.0009;	n=3 mice per group;
Fig. S7C	Two-way repeated-measures ANOVA with *post hoc* Sidak's test: row factor: $F_{2, 28}$=36.67, P<0.0001; column factor: $F_{1, 14}$=0.7468, P=0.4021;	n=8 mice per group;
Fig. S7D	For distance moved per 5 mins: two-way repeated measures ANOVA with *post hoc* Dunnett's test: row factor: $F_{16, 336}$=6.385, P<0.0001; column factor: $F_{2, 21}$=5.657, P=0.0108; *AAV-CON*+MK-801 *vs. AAV-CON*+Saline: P=0.0167; *AAV-CON*+MK-801 *vs. AAV-shHrh*2+MK-801: P=0.9972; for total distance: one-way ANOVA with *post*	

	hoc Dunnett test: $F_{2, 21}$=4.709, *P*=0.0204; *AAV-CON*+MK-801 *vs.* *AAV-CON*+Saline: *P*=0.0310; *AAV-CON*+MK-801 *vs.* *AAV-shHrh2*+MK-801: *P*=0.9900;	
Fig. S7E	For nesting score: unpaired two-tailed *t* test, *t*=0.2607, *P*=0.7981; for unshredded cotton (% weight): unpaired two-tailed *t* test, *t*=0.4612, *P*=0.6517;	
Fig. S7F	Time in close interaction-E *vs.* S1: *AAV-CON*, unpaired two-tailed *t* test, *t*=3.579, *P*=0.0030; *AAV-shHrh2*, unpaired two-tailed *t* test, *t*=4.078, *P*=0.0011; preference index for S1 and E: unpaired two-tailed *t* test, *t*=0.6644, *P*=0.5172; time in close interaction-S1 *vs.* S2: *AAV-CON*, unpaired two-tailed *t* test, *t*=3.821, *P*=0.0019; *AAV-shHrh2*, Mann-Whitney test, *U*=5, *P*=0.0030; preference index for S2 and S1: unpaired two-tailed *t* test, *t*=0.3725, *P*=0.7151;	
Fig. S7G	Unpaired two-tailed *t* test, *t*=0.2615, *P*=0.7975;	
Fig. S7H	Unpaired two-tailed *t* test, *t*=0.3425, *P*=0.7370;	