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The psychotomimetic ketamine disrupts the transfer of late sensory information in the corticothalamic network

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STATISTIC DATA

	Delta	Theta	Sigma	Beta	Gamma
EEG	F (5, 234) = 8.301 P<0.0001	F (5, 234) = 9.963 P<0.0001	F (5, 234) = 22.94 P<0.0001	F (5, 234) = 42.92 P<0.0001	F (5, 234) = 27.14 P<0.0001
Layer 6	F (5, 234) = 44.49 P<0.0001	F (5, 234) = 12.81 P<0.0001	F (5, 234) = 26.41 P<0.0001	F (5, 234) = 31.48 P<0.0001	F (5, 234) = 21.06 P<0.0001
VPm	F (5, 234) = 1.485 P=0.1953	F (5, 234) = 8.219 P<0.0001	F (5, 234) = 23.49 P<0.0001	F (5, 234) = 42.43 P<0.0001	F (5, 234) = 9.657 P<0.0001
PoM	F (5, 234) = 1.106 P=0.0867	F (5, 234) = 2.596 P=0.0175	F (5, 234) = 12.66 P<0.0001	F (5, 234) = 12.37 P<0.0001	F (5, 234) = 8.754 P<0.0001

Table 1 (see Fig. 2A): One-way repeated-measures ANOVA shows significant effects of stimuli in different frequencies under saline condition.

EEG

	Delta	Theta	Sigma	Beta	Gamma
200-700 ms	P<0.0001	P<0.0001	P<0.0001	P<0.0001	P<0.0001
700-1200 ms	P=0.0005	P=0.0001	P=0.0023	P=0.1935	P=0.9906
1200-1700 ms	P=0.1177	P=0.0001	P=0.1961	P=0.7959	P=0.9906
1700-2200 ms	P=0.9818	P=0.2999	P=0.4617	P=0.8546	P=0.9988
2200-2700 ms	P=0.9818	P=0.3278	P=0.5079	P=0.8546	P=0.9988

Layer 6

	Delta	Theta	Sigma	Beta	Gamma
200-700 ms	P<0.0001	P<0.0038	P<0.0001	P<0.0001	<0.0001
700-1200 ms	P=0.0059	P<0.0001	P=0.0046	P=0.9624	P=0.9583
1200-1700 ms	P=0.2774	P=0.0003	P=0.0580	P=0.9965	P=0.9583
1700-2200 ms	P=0.9549	P<0.3421	P=0.4754	P=0.9967	P=0.9583
2200-2700 ms	P=0.9549	P<0.5618	P=0.4754	P=0.9965	P=0.9583

VPm

	Delta	Theta	Sigma	Beta	Gamma
200-700 ms	P=0.7821	P<0.0001	P<0.0001	P<0.0001	P<0.0001
700-1200 ms	P=0.8703	P=0.0001	P=0.0140	P=0.8552	P=0.1538
1200-1700 ms	P=0.5827	P=0.0391	P=0.1492	P=0.8552	P=0.7689
1700-2200 ms	P=0.8703	P=0.5925	P=0.7579	P=0.9404	P=0.9904
2200-2700 ms	P=0.8703	P=0.7764	P=0.7579	P=0.9404	P=0.9293

PoM

	Delta	Theta	Sigma	Beta	Gamma
200-700 ms	P=0.2731	P=0.0091	P=<0.0001	P<0.0001	P<0.0001
700-1200 ms	P=0.3881	P=0.0424	P=0.3243	P=0.6621	P=0.7778
1200-1700 ms	P=0.3881	P=0.0899	P=0.3772	P=0.5365	P=0.2742
1700-2200 ms	P=0.4415	P=0.0899	P=0.4669	P=0.5365	P=0.7778
2200-2700 ms	P=0.1947	P=0.3154	P=0.4669	P=0.5566	P=0.7778

Table 2 (see Fig2A): Holm-Šidák’s multiple comparisons test shows various powers in different periods after stimuli.

	Delta	Theta	Sigma	Beta	Gamma
EEG	F (5, 234) = 7.175 P<0.0001	F (5, 234) = 17.63 P<0.0001	F (5, 234) = 60.99 P<0.0001	F (5, 234) = 24.78 P<0.0001	F (5, 234) = 3.866 P<0.0022
Layer 6	F (5, 234) = 11.41 P<0.0001	F (5, 234) = 14.21 P<0.0001	F (5, 234) = 48.59 P<0.0001	F (5, 234) = 8.772 P<0.0001	F (5, 234) = 12.14 P<0.0001
VPm	F (5, 234) = 1.473 P=0.1995	F (5, 234) = 15.07 P<0.0001	F (5, 234) = 25.60 P<0.0001	F (5, 234) = 11.84 P<0.0001	F (5, 234) = 0.5845 P<0.7119
PoM	F (5, 234) = 13.79 P=0.2276	F (5, 234) = 6.697 P<0.0001	F (5, 234) = 16.22 P<0.0001	F (5, 234) = 7.792 P<0.0001	F (5, 234) = 0.7948 P<0.5543

Table 3 (see Fig. 2B): One-way repeated-measures ANOVA shows significant effects of stimuli in different frequencies under the ketamine condition.

EEG

	Delta	Theta	Sigma	Beta	Gamma
200-700 ms	P<0.0031	P<0.0001	P<0.0001	P<0.0001	P=0.0727
700-1200 ms	P=0.0011	P=0.1957	P=0.9745	P=0.0892	P=0.8169
1200-1700 ms	P=0.9862	P=0.9970	P=0.9909	P=0.2047	P=0.2142
1700-2200 ms	P=0.9862	P=0.9970	P=0.9909	P=0.7108	P=0.0021
2200-2700 ms	P=0.9862	P=0.9970	P=0.9909	P=0.7793	P=0.0416

Layer 6

	Delta	Theta	Sigma	Beta	Gamma
200-700 ms	P<0.0001	P<0.0001	P<0.0001	P=0.0083	P=0.0612
700-1200 ms	P<0.0001	P<0.0071	P=0.9882	P=0.0311	P=0.1237
1200-1700 ms	P=0.9984	P=0.9938	P=0.9780	P=0.0811	P=0.3672
1700-2200 ms	P=0.9984	P<0.9938	P=0.9882	P=0.6557	P=0.0016
2200-2700 ms	P=0.9984	P<0.9938	P=0.9882	P=0.4294	P=0.0101

VPm

	Delta	Theta	Sigma	Beta	Gamma
200-700 ms	P=0.4336	P<0.0001	P<0.0001	P=0.0004	P=0.5811
700-1200 ms	P=0.9740	P=0.9962	P=0.8272	P=0.1091	P=0.5811
1200-1700 ms	P=0.7018	P=0.9845	P=0.8272	P=0.1091	P=0.5811

1700-2200 ms	P=0.9427	P=0.9973	P=0.8272	P=0.1486	P=0.5811
2200-2700 ms	P=0.9427	P=0.9973	P=0.8272	P=0.1091	P=0.5811

PoM

	Delta	Theta	Sigma	Beta	Gamma
200-700 ms	P<0.0001	P<0.0001	P=<0.0001	P=0.0007	P=0.7127
700-1200 ms	P=0.9575	P=0.9638	P=0.8902	P=0.6488	P=0.7127
1200-1700 ms	P=0.9575	P=0.7490	P=0.9046	P=0.4235	P=0.5446
1700-2200 ms	P=0.7864	P=0.9938	P=0.9046	P=0.6488	P=0.5446
2200-2700 ms	P=0.7864	P=0.9938	P=0.8902	P=0.6488	P=0.4017

Table 4 (see Fig. 2B): Holm-Šidák’s multiple comparisons test shows various powers in different periods after stimuli.

EEG	Layer 6	VPm	PoM
t(39)=8.359 P<0.0001	t(39)=8.343 P<0.0001	t(39)=9.852 P<0.0001	t(39)=10.99 P<0.0001

Table 5 (see S4): Paired t-test shows that gamma oscillations of ketamine differ from the saline condition.

	EEG	Layer 6	VPm	PoM
Condition	F(1, 78)=2.175 P=0.1443	F(1, 78)=5.652 P=0.0199	F(1, 78)=9.363 P=0.0030	F(1, 78)=14.51 P=0.0003
Time	F(4, 312)=23.07 P<0.0001	F(4,312)=13.07, P<0.0001	F(4,312)=5.863, P=0.0001	F(4, 312)=8.296 P<0.0001
condition*time	F(4, 312) = 21.85 P<0.0001	F(4, 312) = 27.11 P<0.0001	F(4, 312) = 6.036 P<0.0001	F(4, 312)=6.247 P<0.0001

Table 6 (see Fig. 3): Two-way repeated-measures ANOVA shows significant effects of ketamine administration, time, and time-drug interaction of ketamine in the induced gamma oscillation power.

	EEG	Layer6	VPm	PoM
200-700 ms	P<0.0001	P<0.0001	P<0.0001	P<0.0001
700-1200 ms	P=0.8645	P=0.8244	P=0.5084	P=0.6855
1200-1700 ms	P=0.3041	P=0.6764	P=0.1529	P=0.0268
1700-2200 ms	P=0.1177	P=0.0646	P=0.5084	P=0.1742
2200-2700 ms	P=0.3041	P=0.1995	P=0.5084	P=0.1742

Table 7 (see Fig. 3): Holm-Šidák’s multiple comparisons test shows ketamine substantially affects induced gamma oscillations during the post-stimulus 200-500 ms window.

Layer 6	VPm
t(39)=-2.5509 P<0.05	t(39)= -2.2930 P<0.05

Table 8 (see Fig. 4): Paired t-test shows that multi-scale entropy of VPm and layer 6 were changed by ketamine.

	Layer 6-VPm	Layer 6-PoM	VPm-PoM
Sum of positive, negative ranks	236.0, -584.0	520.0 -300.0	463.0 -357.0
Sum of signed ranks	-348.0 P=0.0185	220.0 P=0.1423	106.0 P=0.4845

Table 9 (see Fig. 5): Wilcoxon test shows that coherence between layer 6 and VPm were decreased significantly by ketamine.