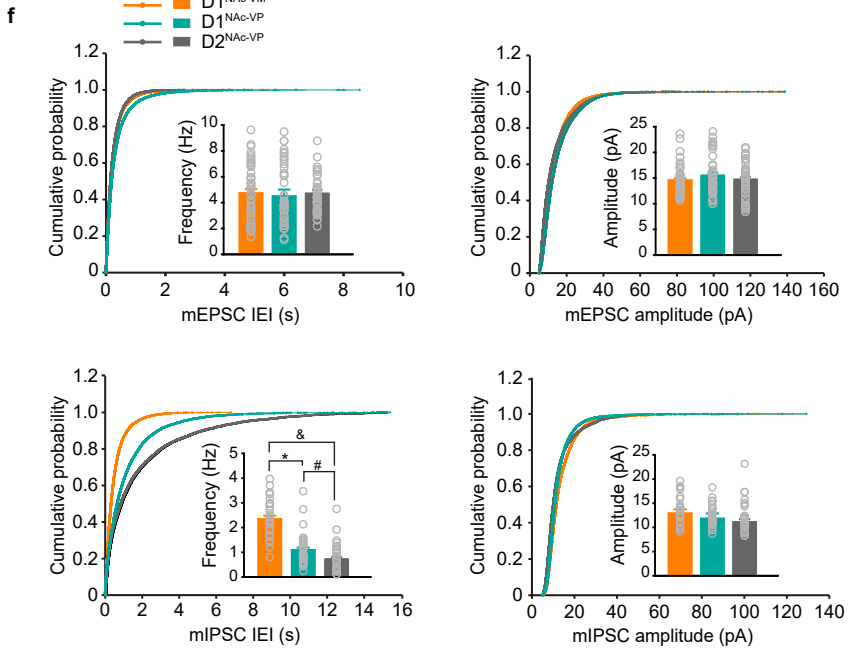
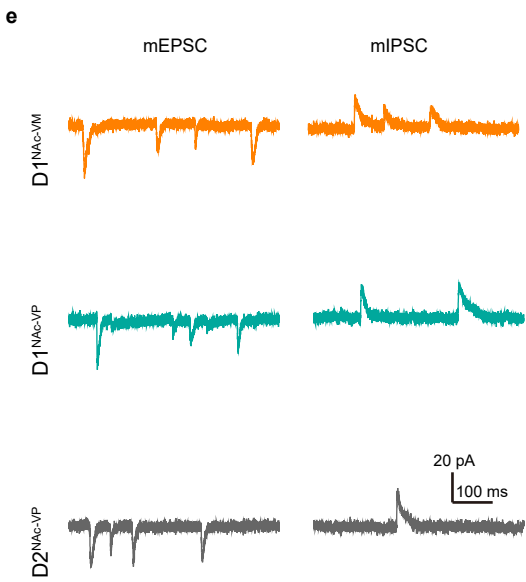


**d** Intrinsic cellular excitability of D1<sup>NAc-VM</sup>, D1<sup>NAc-VP</sup> and D2<sup>NAc-VP</sup>

Measurement	D1 <sup>NAc-VM</sup>	D1 <sup>NAc-VP</sup>	D2 <sup>NAc-VP</sup>
Rheobase (pA)	128.5 ± 2.9	112.1 ± 2.5 <sup>***</sup>	96.6 ± 2.5 <sup>&amp;&amp;&amp;###</sup>
AP threshold (mV)	-39.3 ± 0.3	-38.3 ± 0.4 <sup>*</sup>	-38.4 ± 0.4
Input Resistance (MΩ)	115.1 ± 3.9	114.8 ± 4.4	143.1 ± 6.8 <sup>&amp;#</sup>
Resting Potential (mV)	-76.8 ± 0.6	-75.2 ± 0.7	-73.5 ± 0.8 <sup>*</sup>
Membrane Resistance (MΩ)	124.6 ± 3.0	127.6 ± 2.7	150.1 ± 4.3 <sup>&amp;#</sup>

<sup>#</sup> $p < 0.05$ , <sup>###</sup> $p < 0.001$ , <sup>\*</sup> $p < 0.05$ , <sup>\*\*\*</sup> $p < 0.001$  vs D1<sup>NAc-VM</sup>, <sup>&</sup> $p < 0.05$ , <sup>&&&</sup> $p < 0.001$  vs D1<sup>NAc-VP</sup>.



**Supplementary information, Fig. 9 Electrophysiological properties of D1<sup>NAc-VM</sup> and D1<sup>NAc-VP</sup> neurons.**

**a**, Schematic of electrophysiological recording of D1<sup>NAc-VM</sup>, D1<sup>NAc-VP</sup>, and D2<sup>NAc-VP</sup> neurons in *D1-tdTomato* or *D2-eGFP* mice injected with CTB488 or CTB555. **b**, Graph for numbers of spike firings at the indicated current steps. [RM ANOVA with Geisser-Greenhouse correction, D1<sup>NAc-VM</sup> n = 42 from 9 mice, D1<sup>NAc-VP</sup> n = 40 from 10 mice, D2<sup>NAc-VP</sup> n = 34 from 10 mice,  $F_{\text{type} \times \text{current}}(20, 1130) = 25.353, p < 0.001$ .] \*\*\* $p < 0.001$ , ## $p < 0.01$ , &&& $p < 0.001$  vs indicated group. **c**, Representative voltage traces recording. The voltage responses were evoked by 100-pA and 200-pA current injections. **d**, Diagram of intrinsic cellular excitability of D1<sup>NAc-VM</sup>, D1<sup>NAc-VP</sup> and D2<sup>NAc-VP</sup> neurons [One-way ANOVA, D1<sup>NAc-VM</sup> n = 42 from 9 mice, D1<sup>NAc-VP</sup> n = 40 from 10 mice, D2<sup>NAc-VP</sup> n = 34 from 10 mice, Rheobase:  $F_{(2, 115)} = 34.965, p < 0.001$ ; Resting potential:  $F_{(2, 115)} = 5.343, p = 0.006$ ; *Kruskal-Wallis* One-way ANOVA on Ranks, AP threshold:  $H = 10.793$  with 2 degrees of freedom,  $p = 0.005$ ; Membrane resistance:  $H = 21.417$  with 2 degrees of freedom,  $p < 0.001$ ; Input resistance: D1<sup>NAc-VM</sup> n = 41, D1<sup>NAc-VP</sup> n = 33, D2<sup>NAc-VP</sup> n = 34,  $H = 11.449$  with 2 degrees of freedom,  $p = 0.003$ ]. \* $p < 0.05$ , \*\*\* $p < 0.001$ , # $p < 0.05$ , ### $p < 0.01$ , & $p < 0.05$ , &&& $p < 0.001$  vs indicated group. **e**, Representative traces of mEPSCs (left) and mIPSCs (right). **f**, Graphs for cumulative probability and bar graphs for mean values of frequency (left) and amplitude (right) of mEPSCs (upper, D1<sup>NAc-VM</sup> n = 45 from 9 mice, D1<sup>NAc-VP</sup> n = 47 from 8 mice, D2<sup>NAc-VP</sup> n = 45 from 8 mice) and mIPSCs (lower, D1<sup>NAc-VM</sup> n = 36 from 8 mice, D1<sup>NAc-VP</sup> n = 39 from 9 mice, D2<sup>NAc-VP</sup> n = 36 from 7 mice). [*Kruskal-Wallis* One-way ANOVA on Ranks,  $H = 56.698$  with 2 degrees of freedom,  $p < 0.001$ ]. \* $p < 0.05$ , # $p < 0.05$ , & $p < 0.05$  vs indicated group. \* $p < 0.05$ , # $p < 0.05$ , & $p < 0.05$  vs indicated group. Related

to Figure 4.