Supplemental information
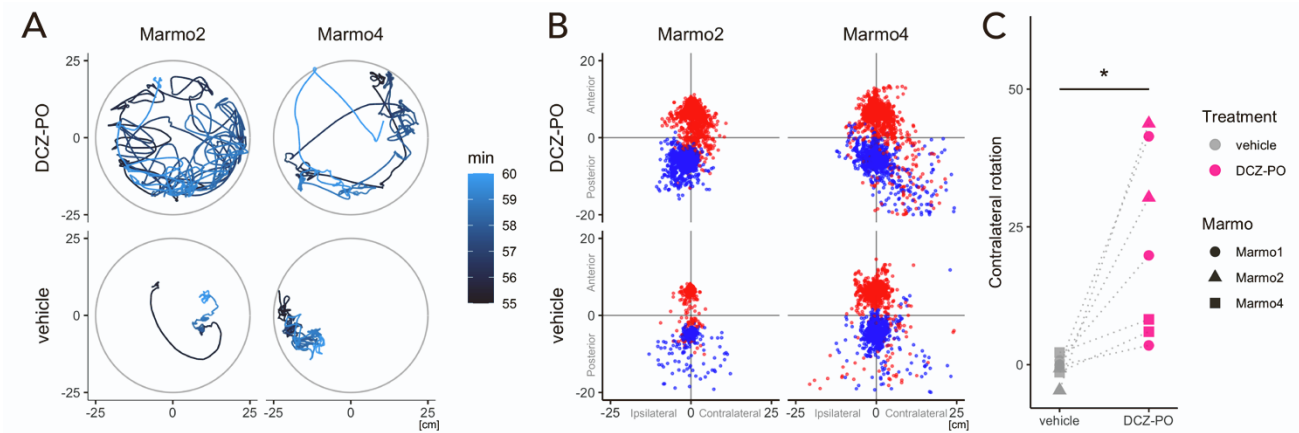
Chemogenetic activation of nigrostriatal dopamine

neurons in freely moving common marmosets

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Figure S1: Chemogenetic-induced behavior alternations in hM3Dq-expressing marmosets, related to Figure 5. (A) Example of the top view of the *Head* trajectory during 55–60 min after vehicle and deschloroclozapine (DCZ; 10 µg/kg, *per os* [PO]) administration in Marmo2 and 4. (B) Scatter plots of the *Head* (red) and *Hip* (blue) positions during 45-60 min following vehicle and DCZ-PO administration in Marmo2 and 4. The format is the same as in Figure 5B, except that relative *Head* and *Hip* positions are determined every 0.5 s in the A–P I–C plane for Marmo2. (C) Total contralateral rotations in vehicle- and DCZ-PO treated sessions (after 45 min of treatment). Asterisk indicates a significant difference (p = 0.003, F[1, 12] = 14.0, repeated-measures one-way ANOVA).
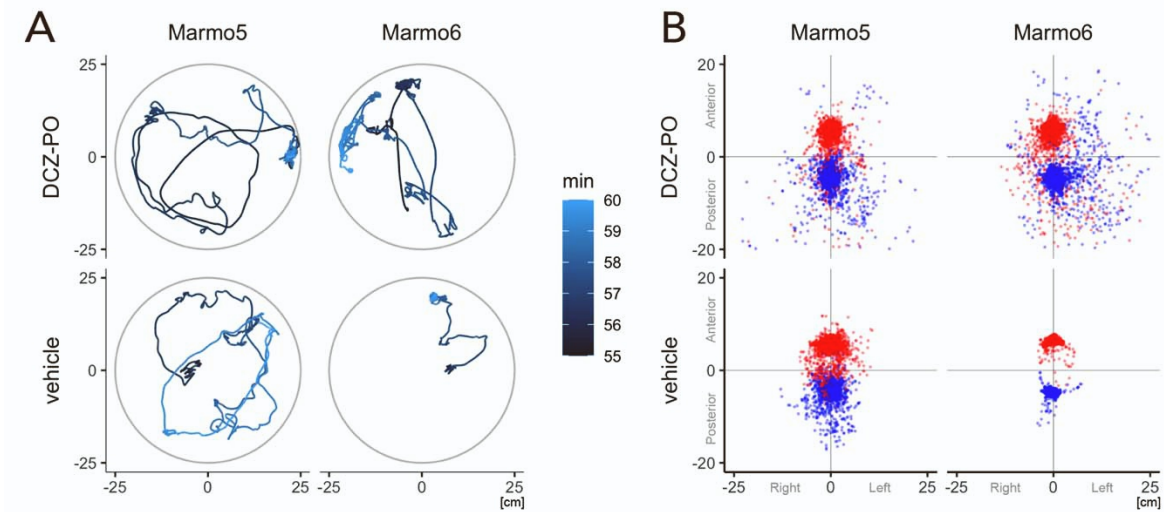
Figure S2: No behavioral alternations in non-DREADD marmosets following DCZ-PO, related to Figure 5. (A) Example of the top view of the *Head* trajectories 55–60 min following vehicle and DCZ administration (10 µg/kg, *per os* [PO]) in Marmo5 and 6. There was no significant difference in moving velocity between the treatment conditions in these two non-DREADD marmosets ($p = 0.95$, $F[2, 3] = 0.057$). (B) Scatter plots of the *Head* (red) and *Hip* (blue) positions during 45-60 min following vehicle and DCZ administration, where relative *Head* and *Hip* positions are determined every 3 s in the A–P Right–Left plane. Unlike the cases in hM3Dq-expressing marmosets shown in Figure 5B or Figure S1, there was no significant deviation of *Head* or *Hip* position. DREADD, designer receptor exclusively activated by designer drugs; DCZ, deschloroclozapine.
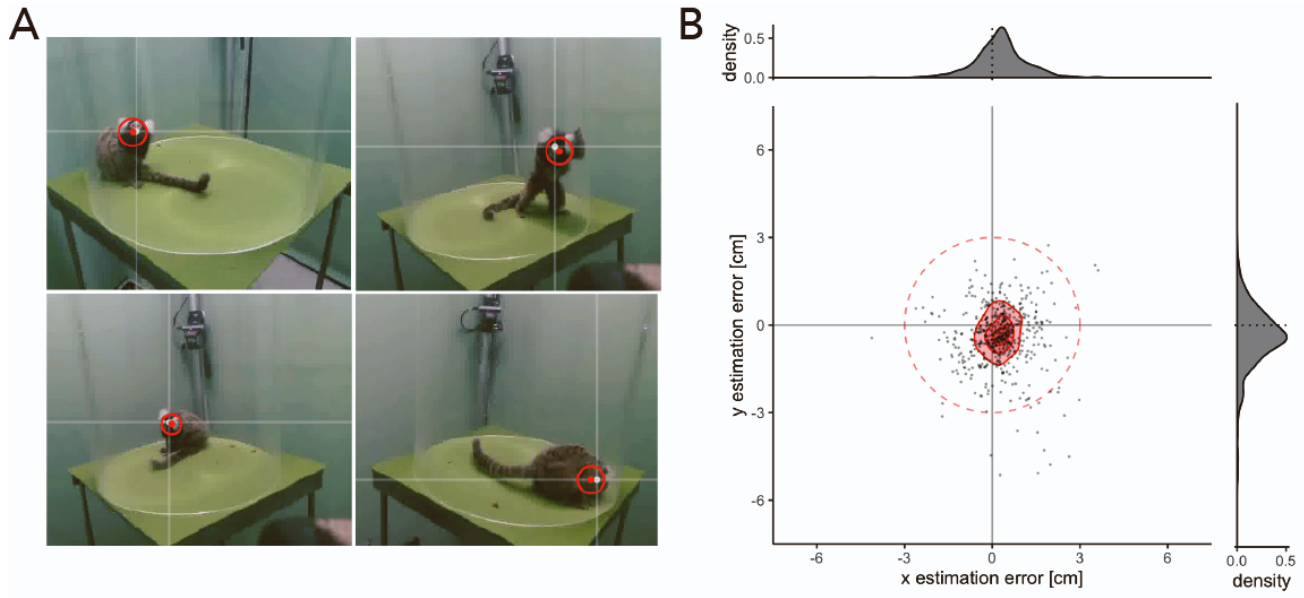
Figure S3: Estimated errors of the marmoset *Head* position, related to STAR Methods.
(A) Examples of 2D projection images of the 3D *Head* position (red circle with center point) estimated by the motion tracking system [MTS] and manually annotated head position (white point with x and y axes). (B) Scatter and density plots of error between manual annotation and MTS-estimated results on 2D projection images calibrated with *Head* skeleton radius (3 cm, red circle in A) in 500 randomly selected frames. The red areas on the 2D density plot represent quantile kernel densities (75, 50, and 25 percentiles). Mean ± SEM errors were 0.26 ± 0.04 and −0.41 ± 0.05 cm, on the X- and Y-axes, respectively. 98% of estimated positions were inside the *Head* area (distance < 3 cm).