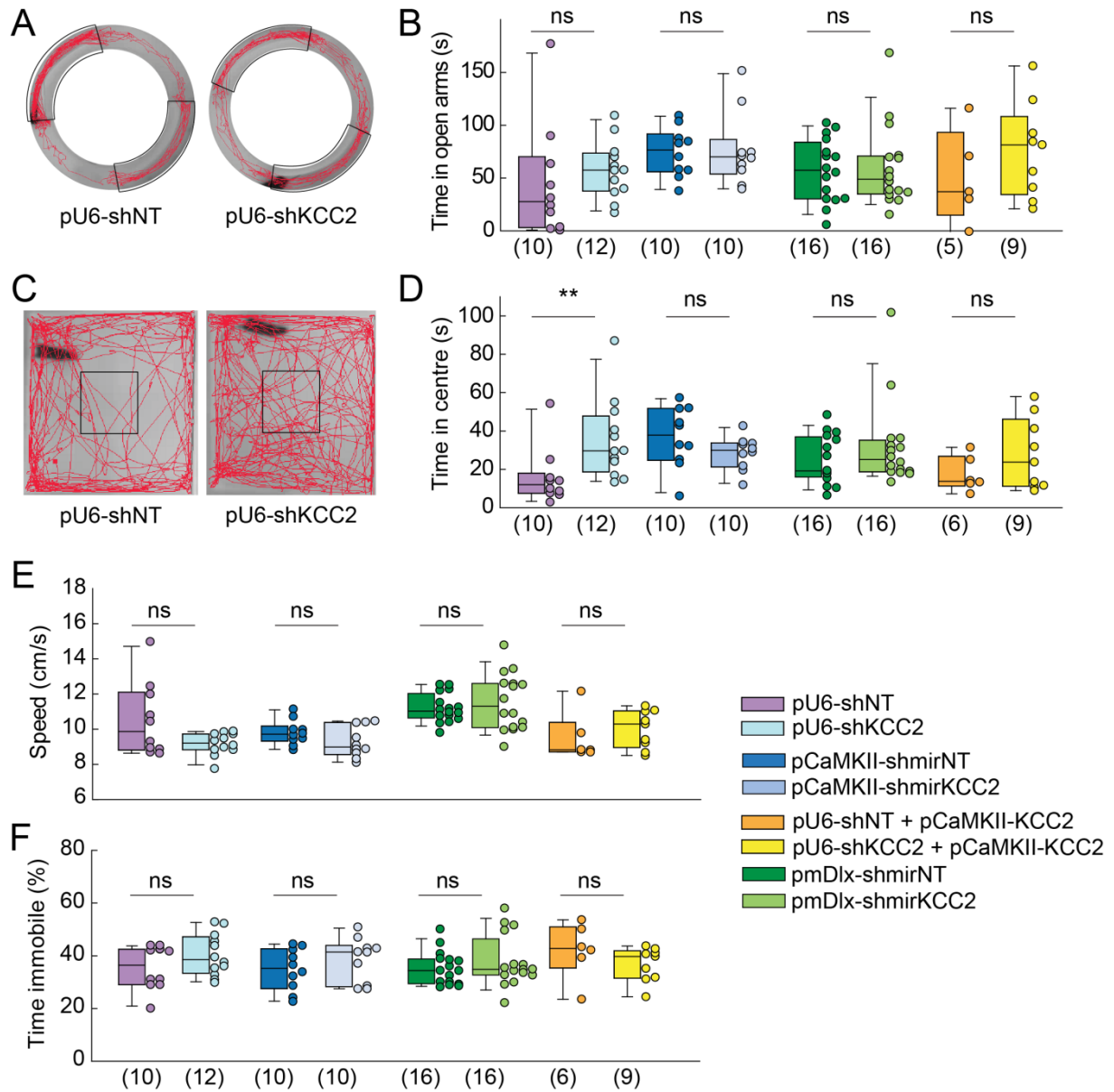


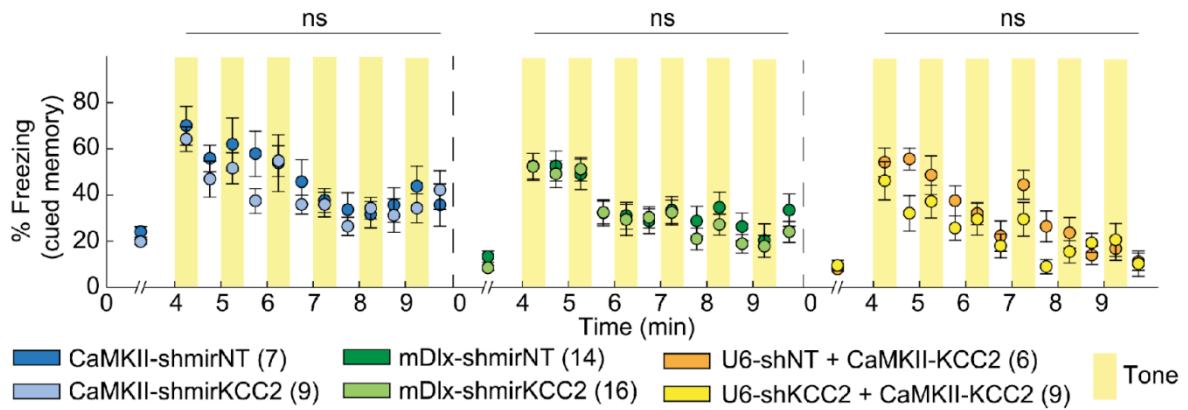
Supplementary Figures



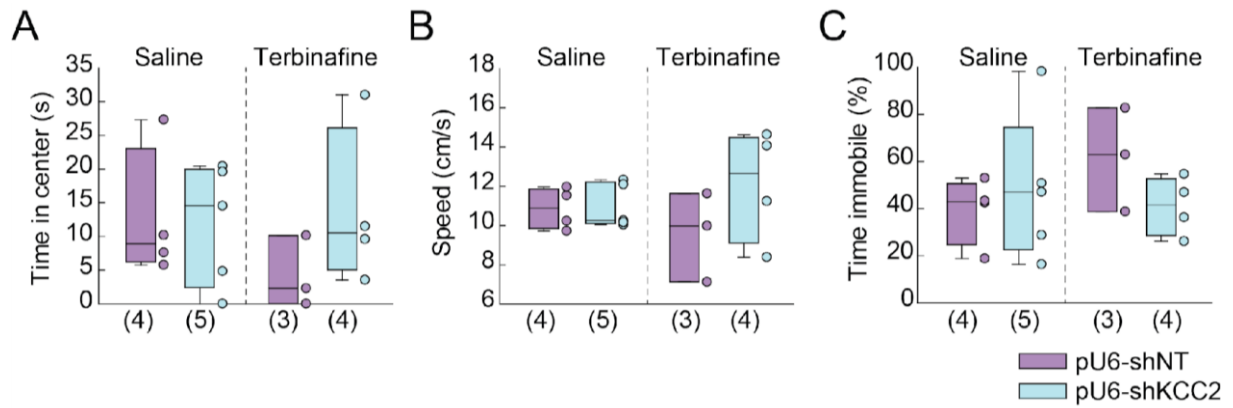
Supplementary Figure 1 (related to Figures 1 and 2). Effect of hippocampal KCC2

knockdown on anxiety and locomotion. A. Representative trajectories of individual mice in the elevated O-maze. Boxed areas correspond to closed arms. **B.** Distributions of time spent in open arms for mice injected with various vectors. Numbers of animals are shown in brackets. No significant difference was observed for any manipulation of KCC2 expression. **C.** Representative trajectories of individual mice in an open field. The center square

corresponds to 1/9 of the total surface of the arena. **D.** Distributions of time spent in the center. No significant difference was observed for any manipulation of KCC2 expression except for mice injected with U6-shKCC2 compared to U6-shNT vectors, showing enhanced time spent in center (Mann-Whitney test, *** $p=0.006$). **E-F.** Distribution of total distance traveled during 10 minutes exploration of an open field (E) and total running speed (total distance/time in movement) (F) for mice infected with various vectors shown on the right. Again, no significant difference was observed for any manipulation of KCC2 expression.



Supplementary Figure 2 (related to Figure 2). KCC2 downregulation in hippocampal principal cells or interneurons does not affect cued fear memory. Summary plots showing the time course of freezing during exposure to sound associated with foot shock in a new context for the same animals as shown in Figure 2F. Cued memory retention shows no difference between KCC2 knockdown and control (shNT) mice for the three conditions tested. The number of animals in each group is shown in parentheses.



Supplementary Figure 3 (related to Figure 4). Intraventricular infusion of the Task-3 channel activator terbinafine does not seem to affect locomotion or anxiety in mice.

Summary graphs showing the effect of intraventricular infusion of terbinafine versus saline on the behavior of mice in the open field test. Mice were injected in the dorsal hippocampus with viruses expressing either non-target (purple) or KCC2-directed (cyan) shRNA. Distribution of time spent in the center of the open field (A), mean running speed (B), and time to immobility (C). No significant differences were observed for any of these parameters (Mann Whitney test, $0.119 < p < 0.897$). The number of animals in each group is shown in parentheses.