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# Neural dynamics underlying associative learning in the dorsal and ventral hippocampus

In the format provided by the authors and unedited

| Figure | Variable | Unit of Comparison | n | Test | Results |
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| Fig. 1g | odor1/odor2 decoding accuracy, vCA1 vs dCA1 | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided Mann-Whitney U | colored-coded bar above graph shows time bins where p < 0.01 |
| Fig. 1i | decoding accuracy vs chance | 10 decoding iterations for each region | pseudopopulation (see methods) of 454 cells (n-matched in vCA1 and dCA1) from 11 vCA1 and 5 dCA1 mice | two-sided Wilcoxon | color-coded bars above graph show time bins where p < 0.01 |
| Fig. 2D | mean lick rate (Hz) | Trial type (Early session) | 16 mice (11 vCA1 and 5 dCA1 mice) | two-sided Mann-Whitney U | U =75.5, p =0.13, effect-size (r) = 0.28 |
| Fig. 2D | mean lick rate (Hz) | Trial type (Late session) | 16 mice (11 vCA1 and 5 dCA1 mice) | two-sided Mann-Whitney U | U =0, p < 0.0001, effect-size (r) = 0.85 |
| Fig. 2h | vCA1 vs dCA1 CS+/CS- decoding accuracies during odor period (Pre session) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 4 dCA1 mice | two-sided Mann-Whitney U | U = 0, p = 0.00018, effect-size (r) = 0.85 |
| Fig. 2h | vCA1 vs dCA1 CS+/CS- decoding accuracies during odor period (Late session) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided Mann-Whitney U | U = 44, p = 0.68, effect-size (r) = 0.10 |
| Fig. 2h | vCA1 vs dCA1 CS+/CS- decoding accuracies during trace period (Pre session) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 4 dCA1 mice | two-sided Mann-Whitney U | U = 25, p = 0.064, effect-size (r) = 0.42 |
| Fig. 2h | vCA1 vs dCA1 CS+/CS- decoding accuracies during trace period (Late session) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided Mann-Whitney U | U = 32, p = 0.18, effect-size (r) = 0.30 |
| Fig. 2i | CS+/baseline vs CS-/baseline decoding accuracies, vCA1 or dCA1 | 10 decoding iterations for each trial type | n-matched pseudopopulation of 454 cells from 11 vCA1 or 5 dCA1 mice | two-sided Mann-Whitney U | color-coded bars above graph show time bins where p < 0.01 |
| Fig. 2j | vCA1 vs dCA1 CS+/baseline decoding accuracies during odor period (Pre session) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 4 dCA1 mice | two-sided Mann-Whitney U | U =0, p = 0.00017, effect-size (r) = 0.85 |
| Fig. 2j | vCA1 vs dCA1 CS+/baseline decoding accuracies during odor period (Late session) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided Mann-Whitney U | U =69.5, p = 0.15, effect-size (r) = 0.33 |
| Fig. 2j | vCA1 vs dCA1 CS+/baseline decoding accuracies during trace period (Pre session) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 4 dCA1 mice | two-sided Mann-Whitney U | U =25.5, p = 0.069, effect-size (r) = 0.41 |
| Fig. 2j | vCA1 vs dCA1 CS+/baseline decoding accuracies during trace period (Late session) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided Mann-Whitney U | U =56, p = 0.68, effect-size (r) = 0.10 |
| Fig. 2k | odor period vs trace period decoding accuracy vs chance | 10 decoding iterations | pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Wilcoxon | W = 0, p = 0.005, effect-size (r) = 0.85 |
| Fig. 2k | odor period vs trace period decoding accuracy vs chance | 10 decoding iterations | pseudopopulation of 454 cells from 5 dCA1 mice | two-sided Wilcoxon | W = 0, p = 0.005, effect-size (r) = 0.85 |
| Fig. 3e | Early vs Late CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 3e | Early vs Ext CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 83.5, p = 0.038, effect-size (r) = 0.57 |
| Fig. 3e | Early vs Reacq CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U =13.5 , p = 0.019, effect-size (r) = 0.62 |
| Fig. 3e | Late vs Ext CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 3e | Late vs Reacq CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 99, p < 0.001, effect-size (r) = 0.83 |
| Fig. 3e | Ext vs Reacq CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 2.5, p = 0.001, effect-size (r) = 0.80 |
| Fig. 3e | Early vs Late CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 42, p = 1, effect-size (r) = 0.14 |
| Fig. 3e | Early vs Ext CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 70.5, p = 0.39, effect-size (r) = 0.35 |
| Fig. 3e | Early vs Reacq CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 62.5, p = 1, effect-size (r) = 0.21 |

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| Fig. 3e | Late vs Ext CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 79.5, p = 0.1, effect-size (r) = 0.13 |
| Fig. 3e | Late vs Reacq CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 74, p = 0.22, effect-size (r) = 0.41 |
| Fig. 3e | Ext vs Reacq CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 42, p = 1, effect-size (r) = 0.13 |
| Fig. 3e | Early vs Late CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 3e | Early vs Ext CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 58.5, p = 1, effect-size (r) = 0.14 |
| Fig. 3e | Early vs Reacq CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 3e | Late vs Ext CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 3e | Late vs Reacq CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 46.5, p = 1., effect-size (r) = 0.14 |
| Fig. 3e | Ext vs Reacq CS+/CS- decoding accuracies during odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 3e | Early vs Late CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 3e | Early vs Ext CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 26, p = 0.23, effect-size (r) = 0.41 |
| Fig. 3e | Early vs Reacq CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 3e | Late vs Ext CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 3e | Late vs Reacq CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 80.5, p = 0.07, effect-size (r) = 0.52 |
| Fig. 3e | Ext vs Reacq CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=3 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 4c | Across-session Early/Late vs Late/Reacq CS+/CS- decoding accuracies during dodr period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 241 cells from 10 vCA1 mice | two-sided Mann-Whitney U | U = 10, p = 0.003, effect-size (r) = 0.68 |
| Fig. 4c | Across-session Early/Late vs Late/Reacq CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 241 cells from 4 dCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 4c | Across-session Early/Late vs Late/Reacq CS+/CS- decoding accuracies during trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 241 cells from 10 vCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 4c | Across-session Early/Late vs Late/Reacq CS+/CS- decoding accuracies during trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 241 cells from 4 dCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 4d | Early/Late vs Late/Reacq, odor period, CS- trials (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 78, p = 0.038, effect-size (r) = 0.47 |
| Fig. 4d | Early/Late vs Late/Reacq, odor period, CS+ trials (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 100, p = 0.0002, effect-size (r) = 0.85 |

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| Fig. 4d | Early/Late vs Late/Reacq, odor period, CS- trials (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 37, p = 0.35, effect-size (r) = 0.22 |
| Fig. 4d | Early/Late vs Late/Reacq, odor period, CS+ trials (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 46, p = 0.79, effect-size (r) = 0.07 |
| Fig. 4e | Early/Late vs Late/Reacq, trace period, CS- trials (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 58, p = 0.57, effect-size (r) = 0.14 |
| Fig. 4e | Early/Late vs Late/Reacq, trace period, CS+ trials (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 81, p = 0.021, effect-size (r) = 0.52 |
| Fig. 4e | Early/Late vs Late/Reacq, traceperiod, CS- trials (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 56, p = 0.68, effect-size (r) = 0.1 |
| Fig. 4e | Early/Late vs Late/Reacq, trace period, CS+ trials (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 97, p = < 0.001, effect-size (r) = 0.79 |
| Fig. 5b | mean lick rate (Hz) | Trial type (CS1+ vs CS2+; Late session) | 13 mice ( 8 vCA1 and 5 dCA1 mice) | two-sided Mann-Whitney U | U = 96, p = 0.61, effect-size (r) = 0.12 |
| Fig. 5b | mean lick rate (Hz) | Trial type (CS3- vs CS4-; Late session) | 13 mice ( 8 vCA1 and 5 dCA1 mice) | two-sided Mann-Whitney U | U = 79.5, p = 0.81, effect-size (r) = 0.05 |
| Fig. 5b | mean lick rate (Hz) | Trial type (CS+ vs CS-; Late session) | 13 mice ( 8 vCA1 and 5 dCA1 mice) | two-sided Mann-Whitney U | U = 676, p < 0.001, effect-size (r) = 5.96 |
| Fig. 5c | trial type decoding accuracy, Pre session | 10 decoding iterations each | n-matched pseudopopulation of 150 cells from 8 vCA1 mice | two-sided One-way ANOVA | |
| | | | | region | F = 35.2, p < 0.001, effect size (ETA^2) = .31 |
| | | | | odor | F = 1.21, p = 0.31, effect size (ETA^2) = .03 |
| | | | | region*odor | F = 1.4, p = 0.25, effect size (ETA^2) = .04 |
| Fig. 5d | Trial type decoding accuracy, Pre vs Late, odor period (vCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 150 cells from 8 vCA1 mice | two-sided Mann-Whitney U | U = 19.5, p = 0.023, effect-size (r) = 0.52 |
| Fig. 5d | Trial type decoding accuracy, Pre vs Late, odor period (dCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 150 cells from 5 dCA1 mice | two-sided Mann-Whitney U | U = 37.5, p = 0.36, effect-size (r) = 0.21 |
| Fig. 5e | trial type decoding accuracy, Late session | 10 decoding iterations each | n-matched pseudopopulation of 150 cells from 8 vCA1 mice | two-sided One-way ANOVA | |
| | | | | region | F = 36.5, p < 0.001, effect size (ETA^2) = .34 |
| | | | | odor | F = 1.17, p = 0.33, effect size (ETA^2) = .03 |
| | | | | region*odor | F = 1.15, p = 0.22, effect size (ETA^2) = .04 |
| Fig. 5f | CS+ vs CS- decoding accuracy, Pre vs Late, odor period (vCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 150 cells from 8 vCA1 mice | two-sided Mann-Whitney U | U = 1.0, p < 0.001, effect-size (r) = 0.83 |
| Fig. 5f | CS+ vs CS- decoding accuracy, Pre vs Late, odor period (dCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 150 cells from 5 dCA1 mice | two-sided Mann-Whitney U | U = , p < 0.001, effect-size (r) = 0.85 |
| Fig. 5h | outcome decoding, Pre vs Late, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 150 cells from 8 vCA1 mice | two-sided Mann-Whitney U | U = 11.5, p = 0.004, effect-size (r) = 0.65 |
| Fig. 5h | outcome decoding, Pre vs Late, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 150 cells from 5 dCA1 mice | two-sided Mann-Whitney U | U = 48, p = 0.91, effect-size (r) = 0.03 |
| Fig. 5h | outcome decoding, Pre vs Late, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 150 cells from 8 vCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 5h | outcome decoding, Pre vs Late, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 150 cells from 5 dCA1 mice | two-sided Mann-Whitney U | U = 9.5, p = 0.002, effect-size (r) = 0.68 |
| Fig. 5j | CS+/CS- vs CS1+/CS2+, odor period, Pre session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 91, p = 0.004, effect-size (r) = 0.69 |
| Fig. 5j | CS+/CS- vs CS3-/CS4-, odor period, Pre session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 27, p = 0.18, effect-size (r) = 0.39 |
| Fig. 5j | CS1+/CS2+ vs CS3-/CS4-, odor period, Pre session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 11, p = 0.007, effect-size (r) = 0.66 |
| Fig. 5j | CS+/CS- vs CS1+/CS2+, odor period, Late session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 93, p = 0.002, effect-size (r) = 0.72 |

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| Fig. 5j | CS+/CS- vs CS3-/CS4-, odor period, Late session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 5j | CS1+/CS2+ vs CS3-/CS4-, odor period, Late session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 5j | CS+/CS- vs CS1+/CS2+, odor period, Pre session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 98, p < 0.001, effect-size (r) = 0.81 |
| Fig. 5j | CS+/CS- vs CS3-/CS4-, odor period, Pre session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 5j | CS1+/CS2+ vs CS3-/CS4-, odor period, Pre session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 74, p = 0.15, effect-size (r) = 0.41 |
| Fig. 5j | CS+/CS- vs CS1+/CS2+, odor period, Late session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 50, p = 1.0, effect-size (r) = 0.0 |
| Fig. 5j | CS+/CS- vs CS3-/CS4-, odor period, Late session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 25, p = 0.13, effect-size (r) = 0.42 |
| Fig. 5j | CS1+/CS2+ vs CS3-/CS4-, odor period, Late session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 26, p = 0.15, effect-size (r) = 0.41 |
| Fig. 5j | CS+/CS- vs CS1+/CS2+, trace period, Pre session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 58, p = 1.0, effect-size (r) = 0.13 |
| Fig. 5j | CS+/CS- vs CS3-/CS4-, trace period, Pre session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 43, p = 1.0, effect-size (r) = 0.12 |
| Fig. 5j | CS1+/CS2+ vs CS3-/CS4-, trace period, Pre session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 41, p = 0.94, effect-size (r) = 0.15 |
| Fig. 5j | CS+/CS- vs CS1+/CS2+, trace period, Late session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 100, p < 0.001., effect-size (r) = 0.85 |
| Fig. 5j | CS+/CS- vs CS3-/CS4-, trace period, Late session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 100, p < 0.001., effect-size (r) = 0.85 |
| Fig. 5j | CS1+/CS2+ vs CS3-/CS4-, trace period, Late session (vCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 34, p = 0.48, effect-size (r) = 0.27 |
| Fig. 5j | CS+/CS- vs CS1+/CS2+, trace period, Pre session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 41, p = 1.0, effect-size (r) = 0.15 |
| Fig. 5j | CS+/CS- vs CS3-/CS4-, trace period, Pre session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 22, p = 0.08, effect-size (r) = 0.47 |
| Fig. 5j | CS1+/CS2+ vs CS3-/CS4-, trace period, Pre session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 27, p = 0.18, effect-size (r) = 0.39 |
| Fig. 5j | CS+/CS- vs CS1+/CS2+, trace period, Late session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 5j | CS+/CS- vs CS3-/CS4-, trace period, Late session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 5j | CS1+/CS2+ vs CS3-/CS4-, trace period, Late session (dCA1) | Euclidean distance between MDS values | 10 MDS runs | two-sided Mann-Whitney U, bonferroni correction for n=2 | U = 21, p = 0.06, effect-size (r) = 0.49 |

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| Fig. 6b | mean lick rate (Hz) | Trial type (Rew vs Shock; Early session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 133, p = 0.028, effect-size (r) = 0.49 |
| Fig. 6b | mean lick rate (Hz) | Trial type (Rew vs CS-; Early session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 13, p < 0.001, effect-size (r) = 0.71 |
| Fig. 6b | mean lick rate (Hz) | Trial type (Shock vs CS-; Early session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 12.5, p <0.001, effect-size (r) = 0.72 |
| Fig. 6b | mean lick rate (Hz) | Trial type (Rew vs Shock; Late session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 256, p = < 0.001, effect-size (r) = 1.7 |
| Fig. 6b | mean lick rate (Hz) | Trial type (Rew vs CS-; Late session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6b | mean lick rate (Hz) | Trial type (Shock vs CS-; Late session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 0, p = 1, effect-size (r) = 0.56 |
| Fig. 6c | CS+Rew Decoding Accuracy, Early vs Late, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Fisher's Exact | p < 0.001, effect-size (odds ratio) = 0.23 |
| Fig. 6c | CS+Shock Decoding Accuracy, Early vs Late, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Fisher's Exact | p < 0.001, effect-size (odds ratio) = 0.24 |
| Fig. 6c | CS- Decoding Accuracy, Early vs Late, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Fisher's Exact | p = 0.14, effect-size (odds ratio) = 0.72 |
| Fig. 6c | CS+Rew Decoding Accuracy, Early vs Late,trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Fisher's Exact | p < 0.001, effect-size (odds ratio) = 0.26 |
| Fig. 6c | CS+Shock Decoding Accuracy, Early vs Late, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Fisher's Exact | p < 0.001, effect-size (odds ratio) = 0.40 |
| Fig. 6c | CS- Decoding Accuracy, Early vs Late, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Fisher's Exact | p = 0.24, effect-size (odds ratio) = 0.76 |
| Fig. 6c | CS+Rew Decoding Accuracy, Early vs Late,odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Fisher's Exact | p = 0.003, effect-size (odds ratio) = 0.18 |
| Fig. 6c | CS+Shock Decoding Accuracy, Early vs Late, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Fisher's Exact | p = 0.32, effect-size (odds ratio) = 0.63 |
| Fig. 6c | CS- Decoding Accuracy, Early vs Late, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Fisher's Exact | p = 0.73, effect-size (odds ratio) = 0.88 |
| Fig. 6c | CS+Rew Decoding Accuracy, Early vs Late,trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Fisher's Exact | p < 0.001, effect-size (odds ratio) = 0.17 |
| Fig. 6c | CS+Shock Decoding Accuracy, Early vs Late, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Fisher's Exact | p = 0.003, effect-size (odds ratio) = 0.48 |
| Fig. 6c | CS- Decoding Accuracy, Early vs Late, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Fisher's Exact | p = 0.003, effect-size (odds ratio) = 0.52 |
| Fig. 6e | mean lick rate (Hz) | Trial type (Rew vs Shock; Early Reversal session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 82, p = 1, effect-size (r) = 0.02 |
| Fig. 6e | mean lick rate (Hz) | Trial type (Rew vs CS-; Early Reversal session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 21.5, p = 0.003, effect-size (r) = 0.62 |
| Fig. 6e | mean lick rate (Hz) | Trial type (Shock vs CS-; Early Reversal session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 10, p <0.001, effect-size (r) = 0.74 |
| Fig. 6e | mean lick rate (Hz) | Trial type (Rew vs Shock; Late Reversal session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 255, p = < 0.001, effect-size (r) = 1.7 |
| Fig. 6e | mean lick rate (Hz) | Trial type (Rew vs CS-; Late Reversal session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 3, p < 0.001, effect-size (r) = 0.81 |
| Fig. 6e | mean lick rate (Hz) | Trial type (Shock vs CS-; Late Reversal session) | 13 mice ( 10 vCA1 and 3 dCA1 mice) | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 110, p = 1, effect-size (r) = 0.26 |
| Fig. 6f | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies, Late Reversal, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |

| Figure | Variable | Unit of Comparison | n | Test | Results |
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| Fig. 6f | CS+Rew/baseline vs CS-/baseline decoding accuracies, Late Reversal, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6f | CS+Shock/baseline vs CS-/baseline decoding accuracies, Late Reversal, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 97, p < 0.001, effect-size (r) = 0.79 |
| Fig. 6f | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies, Late Reversal, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 17.5, p = 0.03, effect-size (r) = 0.55 |
| Fig. 6f | CS+Rew/baseline vs CS-/baseline decoding accuracies, Late Reversal, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 27.5, p = 0.19, effect-size (r) = 0.38 |
| Fig. 6f | CS+Shock/baseline vs CS-/baseline decoding accuracies, Late Reversal, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 55.5, p = 1, effect-size (r) = 0.09 |
| Fig. 6f | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies, Late Reversal, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6f | CS+Rew/baseline vs CS-/baseline decoding accuracies, Late Reversal, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6f | CS+Shock/baseline vs CS-/baseline decoding accuracies, Late Reversal, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 22.5, p = 0.08, effect-size (r) = 0.46 |
| Fig. 6f | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies, Late Reversal, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6f | CS+Rew/baseline vs CS-/baseline decoding accuracies, Late Reversal, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6f | CS+Shock/baseline vs CS-/baseline decoding accuracies, Late Reversal, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 23.5, p = 0.095, effect-size (r) = 0.45 |
| Fig. 6g | Odor A/baseline vs odor B/baseline decoding accuracies across reversal training, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 42.5, p = 1, effect-size (r) = 0.13 |
| Fig. 6g | Odor A/baseline vs odor C/baseline decoding accuracies across reversal training, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6g | Odor B/baseline vs odor C/baseline decoding accuracies across reversal training, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6g | Odor A/baseline vs odor B/baseline decoding accuracies across reversal training, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 36, p = 0.61, effect-size (r) = 0.24 |
| Fig. 6g | Odor A/baseline vs odor C/baseline decoding accuracies across reversal training, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 39.5, p = .9, effect-size (r) = 0.18 |
| Fig. 6g | Odor B/baseline vs odor C/baseline decoding accuracies across reversal training, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 28, p = .21, effect-size (r) = 0.37 |
| Fig. 6h | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies across reversal training, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6h | CS+Rew/baseline vs CS-/baseline decoding accuracies across reversal training, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6h | CS+Shock/baseline vs CS-/baseline decoding accuracies across reversal training, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 10 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 55, p = 1, effect-size (r) = 0.08 |

| Figure | Variable | Unit of Comparison | n | Test | Results |
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| Fig. 6h | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies across reversal training, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6h | CS+Rew/baseline vs CS-/baseline decoding accuracies across reversal training, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 0, p < 0.001, effect-size (r) = 0.85 |
| Fig. 6h | CS+Shock/baseline vs CS-/baseline decoding accuracies across reversal training, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 281 cells from 3 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 49, p = 1, effect-size (r) = 0.17 |
| Fig. 7c | propotion of reward trials with suprathreshold running | Early vs. Late sessions | 12 mice (8 vCA1, 4 dCA1) | two-sided Mann-Whitney U | U = 36, p = 0.004, effect-size (r) = 0.2 |
| Fig. 7c | propotion of CS- trials with suprathreshold running | Early vs. Late sessions | 12 mice (8 vCA1, 4 dCA1) | two-sided Mann-Whitney U | U = 43.5, p = 0.01, effect-size (r) = 0.18 |
| Fig. 7c | propotion of shock trials with suprathreshold running | Early vs. Late sessions | 12 mice (8 vCA1, 4 dCA1) | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.32 |
| Fig. 7d | mean lick rate (Hz) | Trial type (Rew vs Shock) | 12 mice (8 vCA1, 4 dCA1) | two-sided Mann-Whitney U | U = 139.5, p < 0.001, effect-size (r) = 0.8 |
| Fig. 7d | mean lick rate (Hz) | Trial type (Rew vs CS-) | 12 mice (8 vCA1, 4 dCA1) | two-sided Mann-Whitney U | U = 138, p < 0.001, effect-size (r) = 0.78 |
| Fig. 7d | mean lick rate (Hz) | Trial type (CS- vs Shock) | 12 mice (8 vCA1, 4 dCA1) | two-sided Mann-Whitney U | U = 71.5, p = 1.0, effect-size (r) = 0.006 |
| Fig. 7e | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies, Late, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 44.5, p = 1.0, effect-size (r) = 0.09 |
| Fig. 7e | CS+Rew/baseline vs CS-/baseline decoding accuracies, Late, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 98, p < 0.001, effect-size (r) = 0.81 |
| Fig. 7e | CS+Shock/baseline vs CS-/baseline decoding accuracies, Late, odor period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 7e | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies, Late, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 20.5, p = 0.049, effect-size (r) = 0.5 |
| Fig. 7e | CS+Rew/baseline vs CS-/baseline decoding accuracies, Late, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 36.5, p = 0.64, effect-size (r) = 0.23 |
| Fig. 7e | CS+Shock/baseline vs CS-/baseline decoding accuracies, Late, odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 65.5, p = 0.47, effect-size (r) = 0.26 |
| Fig. 7e | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies, Late, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 7e | CS+Rew/baseline vs CS-/baseline decoding accuracies, Late, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| Fig. 7e | CS+Shock/baseline vs CS-/baseline decoding accuracies, Late, trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 60, p = 0.94, effect-size (r) = 0.17 |
| Fig. 7e | CS+Rew/baseline vs CS+Shock/baseline decoding accuracies, Late, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 40, p = 0.92, effect-size (r) = 0.17 |
| Fig. 7e | CS+Rew/baseline vs CS-/baseline decoding accuracies, Late, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 76, p = 0.1, effect-size (r) = 0.44 |
| Fig. 7e | CS+Shock/baseline vs CS-/baseline decoding accuracies, Late, trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 81.5, p = 0.035, effect-size (r) = 0.53 |
| ED Fig. 2c | odor1/odor2 decoding accuracy, vCA1 vs dCA1 (0.5 sed time bins) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided Mann-Whitney U | colored-coded bar above graph shows time bins where p < 0.01 |
| ED Fig. 2d | odor1/odor2 decoding accuracy, vCA1 vs dCA1 (2 sec time bins) | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided Mann-Whitney U | colored-coded bar above graph shows time bins where p < 0.01 |

| Figure | Variable | Unit of Comparison | n | Test | Results |
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| ED Fig. 2e | decoding accuracy vs baseline | 10 decoding iterations each | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided one-way ANOVA | |
| | | | | region | F = 107, p < 0.001, effect size (ETA^2) = .70 |
| | | | | odor | F = .47, p = 0.5, effect size (ETA^2) = .003 |
| | | | | region*odor | F = 9.92, p = 0.003, effect size (ETA^2) = . 065 |
| ED Fig. 2e | vCA1 vs dCA1 odor1/baseline decoding accuracies | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided Mann-Whitney U | U = 0, p = 0.00017, effect-size (r) = 0.85 |
| ED Fig. 2e | vCA1 vs dCA1 odor2/baseline decoding accuracies | 10 decoding iterations for each region | n-matched pseudopopulation of 454 cells from 11 vCA1 and 5 dCA1 mice | two-sided Mann-Whitney U | U = 12.0, p = 0.0046, effect-size (r) = 0.64 |
| ED Fig. 3c | Early vs Late linear regression of calcium activity and lick rate | Early vs Late sessions | 10 vCA1 mice | two-sided T-test | t = 1.86, p = 0.079, effect-size (Cohen's d) = 0.88 |
| ED Fig. 3c | Early vs Late linear regression of calcium activity and lick rate | Early vs Late sessions | 5 dCA1 mice | two-sided T-test | t = 1.51 p = 0.17, effect-size (Cohen's d) = 1.07 |
| ED Fig. 3d | CS+ responsive cells during odor period, Early vs Late (vCA1) | total combined cells from 11 vCA1 mice | see figure for exact cell numbers | two-sided Fisher's Exact | p = 0.003, effect-size (odds ratio) = 2.02 |
| ED Fig. 3d | CS- responsive cells during odor period, Early vs Late (vCA1) | total combined cells from 11 vCA1 mice | see figure for exact cell numbers | two-sided Fisher's Exact | p = 0.13, effect-size (odds ratio) = 0.6 |
| ED Fig. 3d | CS+ responsive cells during trace period, Early vs Late (vCA1) | total combined cells from 11 vCA1 mice | see figure for exact cell numbers | two-sided Fisher's Exact | p < 0.001, effect-size (odds ratio) = 4.56 |
| ED Fig. 3d | CS- responsive cells during trace period, Early vs Late (vCA1) | total combined cells from 11 vCA1 mice | see figure for exact cell numbers | two-sided Fisher's Exact | p = 0.055, effect-size (odds ratio) = 6.96 |
| ED Fig. 3d | CS+ responsive cells during odor period, Early vs Late (dCA1) | total combined cells from 4 dCA1 mice | see figure for exact cell numbers | two-sided Fisher's Exact | p < 0.001, effect-size (odds ratio) = 2.7 |
| ED Fig. 3d | CS- responsive cells during odor period, Early vs Late (dCA1) | total combined cells from 4 dCA1 mice | see figure for exact cell numbers | two-sided Fisher's Exact | p = 0.38, effect-size (odds ratio) = 0.79 |
| ED Fig. 3d | CS+ responsive cells during trace period, Early vs Late (dCA1) | total combined cells from 4 dCA1 mice | see figure for exact cell numbers | two-sided Fisher's Exact | p < 0.001, effect-size (odds ratio) = 8.24 |
| ED Fig. 3d | CS- responsive cells during trace period, Early vs Late (dCA1) | total combined cells from 4 dCA1 mice | see figure for exact cell numbers | two-sided Fisher's Exact | p = 0.004, effect-size (odds ratio) = 11.3 |
| ED Fig. 4c | CS+/baseline (upper) or CS-/baseline (lower) decoding accuracies, Pre vs Late sessions | 10 decoding iterations for each | n-matched pseudopopulation of 454 cells from 11 vCA1 or 5 dCA1 mice | two-sided Mann-Whitney U | color-coded bars above graph show time bins where p < 0.01 |
| ED Fig. 4d | Early vs Late, odor period (vCA1) | Euclidean distance between CS+ and CS- MDS values | 10 MDS runs | two-sided Mann-Whitney U | U = 2, p < 0.001, effect-size (r) = 0.81 |
| ED Fig. 4d | Early vs Late, trace period (vCA1) | Euclidean distance between CS+ and CS- MDS values | 10 MDS runs | two-sided Mann-Whitney U | U = 3, p < 0.001, effect-size (r) = 0.79 |
| ED Fig. 4d | Early vs Late, odor period (dCA1) | Euclidean distance between CS+ and CS- MDS values | 10 MDS runs | two-sided Mann-Whitney U | U = 25, p = 0.064, effect-size (r) = 0.42 |
| ED Fig. 4d | Early vs Late, trace period (dCA1) | Euclidean distance between CS+ and CS- MDS values | 10 MDS runs | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| ED Fig. 4f | CS+/CS- decoding accuracy, odor period | pre vs post 'aha' point | 11 vCA1 mice | two-sided Mann-Whitney U | U = 21 , p = .031, effect-size (r) = 0.49 |
| ED Fig. 4f | CS+/CS- decoding accuracy, trace period | pre vs post 'aha' point | 11 vCA1 mice | two-sided Mann-Whitney U | U = 0 , p < .001, effect-size (r) = 0.84 |
| ED Fig. 4f | CS+/CS- decoding accuracy, odor period | pre vs post 'aha' point | 4 dCA1 mice | two-sided Mann-Whitney U | U = 27, p = 0.089., effect-size (r) = 0.39 |
| ED Fig. 4f | CS+/CS- decoding accuracy, trace period | pre vs post 'aha' point | 4 dCA1 mice | two-sided Mann-Whitney U | U = 19 , p = .021., effect-size (r) = 0.52. |
| ED Fig. 6i | linear regression of decoder weights (with activity regressed out) across sessions | Early vs Late, odor period | 11 vCA1 mice | linear least-squares regression | slope = 0.1, r^2 = 0.008, p = 0.19 |
| ED Fig. 6i | linear regression of decoder weights (with activity regressed out) across sessions | Early vs Late, trace period | 11 vCA1 mice | linear least-squares regression | slope = 0.19, r^2 = 0.02, p = 0.032 |
| ED Fig. 6i | linear regression of decoder weights (with activity regressed out) across sessions | Late vs Reacquisition, odor period | 10 vCA1 mice | linear least-squares regression | slope = 0.29, r^2 = 0.09, p < 0.001 |
| ED Fig. 6i | linear regression of decoder weights (with activity regressed out) across sessions | Late vs Reacquisition, trace period | 10 vCA1 mice | linear least-squares regression | slope = 0.29, r^2 = 0.08, p < 0.001 |
| ED Fig. 6i | linear regression of decoder weights (with activity regressed out) across sessions | Early vs Late, odor period | 4 dCA1 mice | linear least-squares regression | slope = 0.11, r^2 = 0.014, p = 0.038 |
| ED Fig. 6i | linear regression of decoder weights (with activity regressed out) across sessions | Early vs Late, trace period | 4 dCA1 mice | linear least-squares regression | slope = 0.1, r^2 = 0.004, p = 0.26 |
| ED Fig. 6i | linear regression of decoder weights (with activity regressed out) across sessions | Late vs Reacquisition, odor period | 5 dCA1 mice | linear least-squares regression | slope = 0.21, r^2 = 0.038, p < 0.001 |

| Figure | Variable | Unit of Comparison | n | Test | Results |
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| ED Fig. 6i | linear regression of decoder weights (with activity regressed out) across sessions | Late vs Reacquisition, trace period | 5 dCA1 mice | linear least-squares regression | slope = 0.25, r^2 = 0.05, p < 0.001 |
| ED Fig. 7c | Late session linear regression of calcium activity and breathing rate | imaging sessions | 8 vCA1, 4 dCA1 mice | two-sided T-test | t = 0.69, p = 0.51, effect-size (Cohen's d) = 0.54 |
| ED Fig. 8b | mean lick rate (Hz) | Trial type (CS1+ vs CS2+; Post session) | 13 mice ( 8 vCA1 and 5 dCA1 mice) | two-sided Mann-Whitney U | U = 88.5, p = 0.86, effect-size (r) = 0.05 |
| ED Fig. 8b | mean lick rate (Hz) | Trial type (CS3- vs CS4-; Post session) | 13 mice ( 8 vCA1 and 5 dCA1 mice) | two-sided Mann-Whitney U | U = 42.5, p = 0.07, effect-size (r) = 0.42 |
| ED Fig. 8b | mean lick rate (Hz) | Trial type (CS+ vs CS-; Post session) | 13 mice ( 8 vCA1 and 5 dCA1 mice) | two-sided Mann-Whitney U | U = 676, p < 0.001, effect-size (r) = 5.96 |
| ED Fig. 8e | outcome decoding, odor period vs trace period (vCA1) | 10 decoding iterations for each | 150 cells from 8 vCA1 mice | two-sided Mann-Whitney U | U = 38, p =0.38, effect-size (r) = 0.2 |
| ED Fig. 8e | outcome decoding, odor period vs trace period (dCA1) | 10 decoding iterations for each | 150 cells from 5 dCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| ED Fig. 8g | Across-session Early/Late vs Late/Reacq trial type decoding accuracies during dodr period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 100 cells from 8 vCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| ED Fig. 8g | Across-session Early/Late vs Late/Reacq trial type decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 100 cells from 5 dCA1 mice | two-sided Mann-Whitney U | U = 4, p < 0.001, effect-size (r) = 0.78 |
| ED Fig. 8g | Across-session Early/Late vs Late/Reacq trial type decoding accuracies during trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 100 cells from 8 vCA1 mice | two-sided Mann-Whitney U | U = 7, p = 0.0012, effect-size (r) = 0.73 |
| ED Fig. 8g | Across-session Early/Late vs Late/Reacq trial type decoding accuracies during trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 100 cells from 5 dCA1 mice | two-sided Mann-Whitney U | U = 10, p = 0.003, effect-size (r) = 0.68 |
| ED Fig. 8h | Across-session Early/Late vs Late/Reacq CS+/CS- decoding accuracies during dodr period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 100 cells from 8 vCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| ED Fig. 8h | Across-session Early/Late vs Late/Reacq CS+/CS- decoding accuracies during odor period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 100 cells from 5 dCA1 mice | two-sided Mann-Whitney U | U = 3, p < 0.001, effect-size (r) = 0.79 |
| ED Fig. 8h | Across-session Early/Late vs Late/Reacq CS+/CS- decoding accuracies during trace period (vCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 100 cells from 8 vCA1 mice | two-sided Mann-Whitney U | U = 6, p = 0.001, effect-size (r) = 0.74 |
| ED Fig. 8h | Across-session Early/Late vs Late/Reacq CS+/CS- decoding accuracies during trace period (dCA1) | 10 decoding iterations for each | n-matched pseudopopulation of 100 cells from 5 dCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| ED Fig.9b | CS+Shock/CS- decoding accuracy, odor period, Early vs Late (vCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| ED Fig.9b | CS+Shock/CS- decoding accuracy, odor period, Early vs Late (dCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U | U = 49.5, p = 1, effect-size (r) = 0.008 |
| ED Fig.9b | CS+Shock/CS- decoding accuracy, trace period, Early vs Late (vCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U | U = 9, p = 0.002, effect-size (r) = 0.69 |
| ED Fig.9b | CS+Shock/CS- decoding accuracy, trace period, Early vs Late (dCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U | U = 12, p = 0.005, effect-size (r) = 0.64 |
| ED Fig.9c | CS+Rew/CS- decoding accuracy, odor period, Early vs Late (vCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| ED Fig.9c | CS+Rew/CS- decoding accuracy, odor period, Early vs Late (dCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.77 |
| ED Fig.9c | CS+Rew/CS- decoding accuracy, trace period, Early vs Late (vCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 444 cells from 10 vCA1 mice | two-sided Mann-Whitney U | U = 11, p = 0.004, effect-size (r) = 0.66 |
| ED Fig.9c | CS+Rew/CS- decoding accuracy, trace period, Early vs Late (dCA1) | 10 decoding iterations for each session | n-matched pseudopopulation of 444 cells from 3 dCA1 mice | two-sided Mann-Whitney U | U = 0, p < 0.001, effect-size (r) = 0.85 |
| ED Fig. 9d,e | trial type decoding accuracy, odor period, Late session | 10 decoding iterations each | n-matched pseudopopulation of 444 cells from 10 vCA1 and 3 dCA1 mice | two-sided one-way ANOVA | |
| | | | | region | F = 47.7, p <0.001, effect size (ETA^2) = .24 |
| | | | | odor | F = 33.8, p <0.001, effect size (ETA^2) = .34 |
| | | | | region*odor | F = 14.6, p <0.001, effect size (ETA^2) = .15 |
| ED Fig. 9d,e | trial type decoding accuracy, trace period, Late session | 10 decoding iterations each | n-matched pseudopopulation of 444 cells from 10 vCA1 and 3 dCA1 mice | two-sided one-way ANOVA | |
| | | | | region | F = 2.5, p = 0.12, effect size (ETA^2) = .02 |
| | | | | odor | F = 28.4, p < 0.001, effect size (ETA^2) = .52 |
| | | | | region*odor | F = .94, p = 0.4, effect size (ETA^2) = .03 |
| ED Fig.9i | Odor identity decoding accuracy across reversal learning (Late/Late Reversal), vCA1 vs dCA1 | 10 decoding iterations for each region | n-matched pseudopopulation of 281 cells from 10 vCA1 and 3 dCA1 mice | two-sided Mann-Whitney U | U = 41, p = 0.52, effect-size (r) = 0.15 |

| Figure | Variable | Unit of Comparison | n | Test | Results |
|---|---|---|---|---|---|
| ED Fig.9j | Trial type decoding accuracy across reversal learning, trace period, Rew/CS- accuracy vs Sh/CS- accuracy (vCA1) | 10 decoding iterations each | n-matched pseudopopulation of 281 cells from 10 vCA1 mice | two-sided Mann-Whitney U | U = 100, p < 0.001, effect-size (r) = 0.85 |
| ED Fig.9j | Trial type decoding accuracy across reversal learning, trace period, Rew/CS- accuracy vs Sh/CS- accuracy (dCA1) | 10 decoding iterations each | n-matched pseudopopulation of 281 cells from 3 dCA1 mice | two-sided Mann-Whitney U | U = 100, p < 0.001, effect-size (r) = 0.85 |
| ED Fig. 10c | trial type decoding accuracy, odor period | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 8 vCA1 and 4 dCA1 mice | two-sided one-way ANOVA | |
| | | | | region | F = 1.6, p = 0.21, effect size (ETA^2) = .03 |
| | | | | odor | F = 0.95, p = 0.39, effect size (ETA^2) = .03 |
| | | | | region*odor | F = 1.44, p = 0.25, effect size (ETA^2) = .05 |
| ED Fig. 10c | trial type decoding accuracy, trace period | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 8 vCA1 and 4 dCA1 mice | two-sided one-way ANOVA | |
| | | | | region | F = 5.16, p = 0.027, effect size (ETA^2) = .048 |
| | | | | odor | F = 15.3, p < 0.001, effect size (ETA^2) = .29 |
| | | | | region*odor | F = 9.4, p < 0.001, effect size (ETA^2) = .17 |
| ED Fig. 10d | comparison of Rew vs CS- and Sh vs CS- decoding accuracies during odor period (vCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 10, p = 0.005, effect-size (r) = 0.68 |
| ED Fig. 10d | comparison of Rew vs Sh and Sh vs CS- decoding accuracies during odor period (vCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 33.5, p = 0.34, effect-size (r) = 0.28 |
| ED Fig. 10d | comparison of Rew vs CS- and Rew vs Sh decoding accuracies during odor period (vCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 90, p = 0.003, effect-size (r) = 0.68 |
| ED Fig. 10d | comparison of Rew vs CS- and Sh vs CS- decoding accuracies during trace period (vCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 100, p < 0.001, effect-size (r) = 0.85 |
| ED Fig. 10d | comparison of Rew vs Sh and Sh vs CS- decoding accuracies during trace period (vCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 0, p < 0.001., effect-size (r) = 0.85 |
| ED Fig. 10d | comparison of Rew vs CS- and Rew vs Sh decoding accuracies during trace period (vCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 8 vCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 39.5, p = 0.56, effect-size (r) = 0.18 |
| ED Fig. 10d | comparison of Rew vs CS- and Sh vs CS- decoding accuracies during odor period (dCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 27.5, p = 0.19, effect-size (r) = 0.38 |
| ED Fig. 10d | comparison of Rew vs Sh and Sh vs CS- decoding accuracies during odor period (dCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 29, p = 0.23, effect-size (r) = 0.35 |
| ED Fig. 10d | comparison of Rew vs CS- and Rew vs Sh decoding accuracies during odor period (dCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 83.5, p = 0.024, effect-size (r) = 0.57 |
| ED Fig. 10d | comparison of Rew vs CS- and Sh vs CS- decoding accuracies during trace period (dCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 74.5, p = 0.14, effect-size (r) = 0.41 |
| ED Fig. 10d | comparison of Rew vs Sh and Sh vs CS- decoding accuracies during trace period (dCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 2, p < 0.001, effect-size (r) = 0.81 |
| ED Fig. 10d | comparison of Rew vs CS- and Rew vs Sh decoding accuracies during trace period (dCA1; suprathreshold running trials only) | 10 decoding iterations each | n-matched pseudopopulation of 340 cells from 4 dCA1 mice | two-sided Mann-Whitney U, Bonferroni correction for n=2 | U = 78.5, p = 0.068, effect-size (r) = 0.48 |
| ED Fig. 10e | Late session linear regression of calcium activity and running velocity (4-7.5 sec post odor onset) | imaging sessions | 11 vCA1, 5 dCA1 | two-sided T-test | t = 6.68, p < 0.001, effect-size (Cohen's d) = 3.38 |
| ED Fig. 10f | Late session speed decoding accuracy, vCA1 vs dCA1 | for each trial type, decoding accuracy for each 1 sec time bin spanning a 5 sec ITI period | 15 each region (3 trial types x 5 time bins) | two-sided Mann-Whitney U | U = 75.5, p = 0.13, effect-size (r) = 0.43 |

| Figure | Variable | Unit of Comparison | n | Test | Results |
|---|---|---|---|---|---|
| ED Fig. 10f | Late session speed decoding accuracy vs chance (50%), vCA1 | for each trial type, decoding accuracy for each 1 sec time bin spanning a 5 sec ITI period | 15 | two-sided Wilcoxon signed-rank test | W = 16, p = 0.012, effect-size (r) = 0.57 |
| ED Fig. 10f | Late session speed decoding accuracy vs chance (50%), dCA1 | for each trial type, decoding accuracy for each 1 sec time bin spanning a 5 sec ITI period | 15 | two-sided Wilcoxon signed-rank test | W = 2, p < 0.001, effect-size (r) = 0.81 |

| | | | |
|---|---|---|---|
| N/A | total cells registered across sessions | dCA1 2odor Early-Late | 337 |
| N/A | total cells registered across sessions | dCA1 2odor Late-Reacquisition | 377 |
| N/A | total cells registered across sessions | vCA1 2odor Early-Late | 241 |
| N/A | total cells registered across sessions | vCA1 2odor Late-Reacquisition | 253 |
| N/A | total cells registered across sessions | dCA1 4odor Pre-Late | 503 |
| N/A | total cells registered across sessions | dCA1 4odor Late-Post | 503 |
| N/A | total cells registered across sessions | vCA1 4odor Pre-Late | 104 |
| N/A | total cells registered across sessions | vCA1 4odor Late-Post | 104 |
| N/A | total cells registered across sessions | dCA1 3odor Late-Reversal Late | 281 |
| N/A | total cells registered across sessions | vCA1 3odor Late-Reversal Late | 392 |