How the brain's 'internal compass' works

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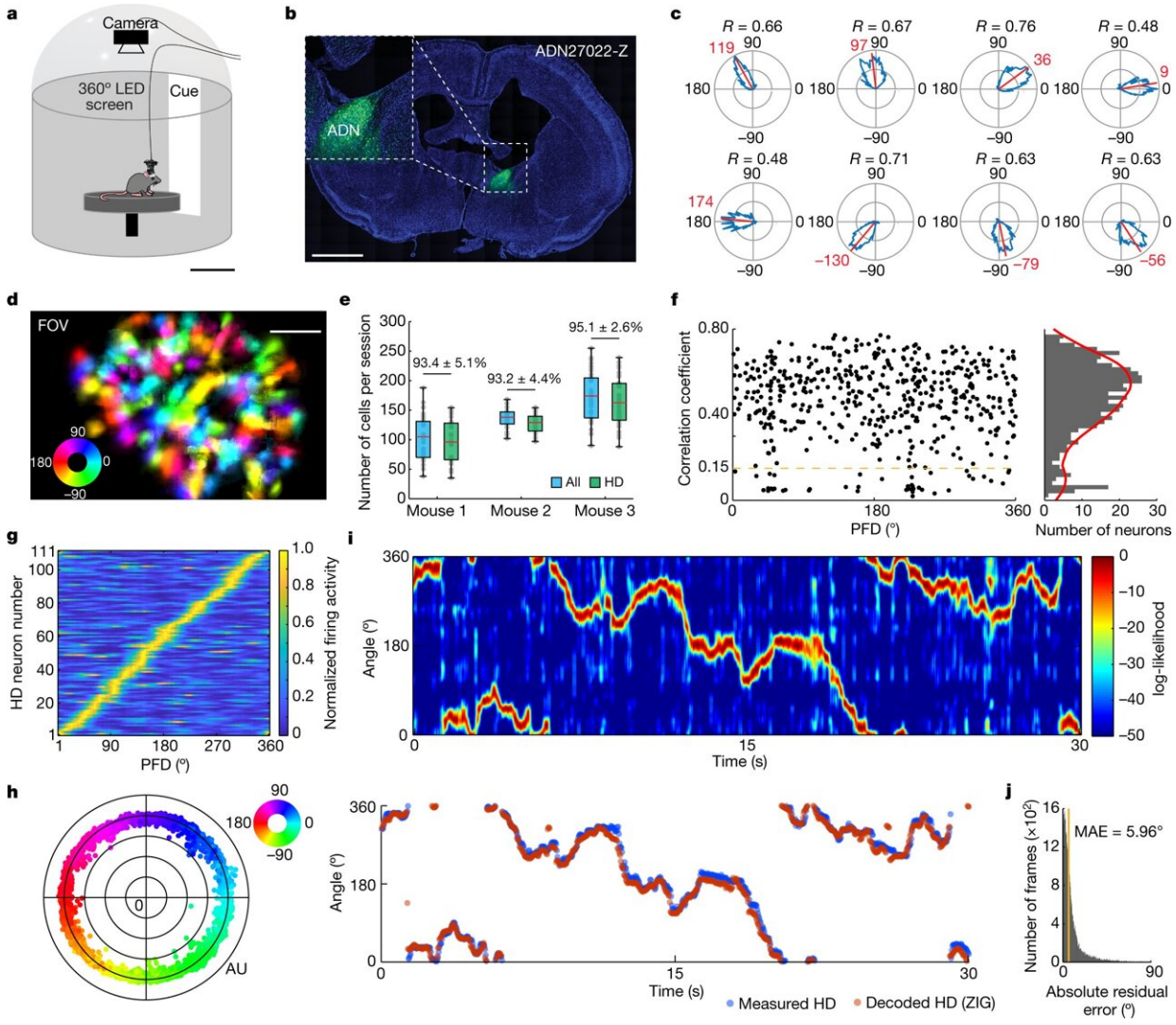

Population recordings in the mouse ADN. a, Schematic of the recording environment within a 360° LED screen. Scale bar, 20 cm. b, GCaMP6f expression in the ADN. In total, 12 mice were injected and implanted for this study, and only 3 (Extended Data Fig. 1a–c) provided enough simultaneously

recorded HD cells for continued experimentation. Scale bar, 2 mm. c, Example tuning curves of ADN cells with high directional tuning in polar coordinates. The red lines and numbers show the mean resultant vectors and PFD, respectively. R, correlation coefficient. d, Field of view (FOV) of the ADN showing the PFD of each cell. Scale bar, 0.125 mm. e, The distribution of ADN cells recorded across mice (n = 3) and sessions (n = 99). The red line indicates the median (minimum, maximum, median, 25th percentile and 75th percentile, respectively, are as follows: mouse 1 (all): 38, 188, 105, 70 and 131; mouse 1 (HD): 35, 154, 96, 66 and 128; mouse 2 (all): 102, 168, 138, 126.5 and 147; mouse 2 (HD): 97, 154, 129, 114.75 and 139.75; mouse 3 (all): 90, 255, 174, 137 and 204.5; mouse 3 (HD): 88, 239, 162.5, 133 and 195.5). The values above the box plots indicate the percentage of HD cells (green) among all recorded ADN cells (blue) shown as mean ± s.d. f, The distribution of correlation coefficients of ADN cells. The dashed yellow line represents the HD neuron detection threshold (shuffled control: P