

Figure S1. Effects of plasticity rate on place field correlation. Activity in a feed-back-inhibition, grid-cell-to-place-cell model was simulated over a period of 61 days with both Hebbian plasticity and synapse turnover. The plasticity rate varied over a 10-million-fold range across simulations. We display place field correlations (Pearson's correlation between cell responses during the late phases of the indicated day and day zero; the median is calculated across all cells with place fields on both days) versus time and the plasticity rate. Points represent median place field correlation in individual simulations. Error bars represent the mean \pm the standard error of the mean. N=10 simulations per condition.

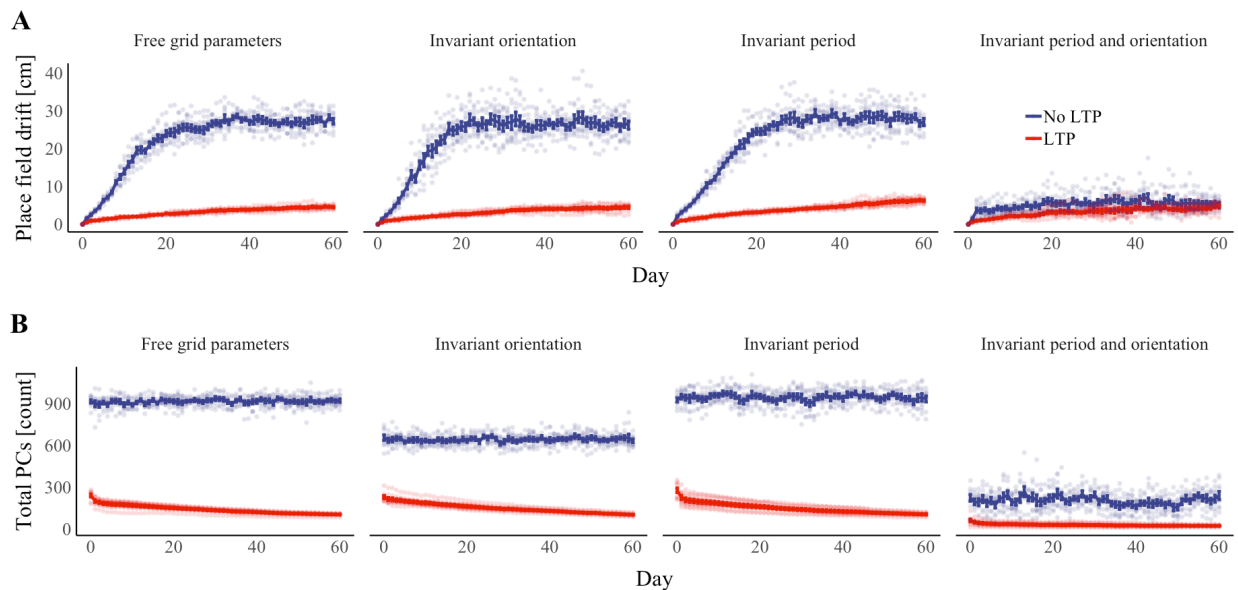


Figure S2. Place field stability with grid cell modularity. Activity in a feed-back-inhibition, grid-cell-to-place-cell model was simulated over a period of 61 days with both Hebbian plasticity and synapse turnover. The grid cell receptive field orientations and periods were either assigned randomly (free) or given a single value across all grid cells (invariant). **(A)** Median place field drift from day zero versus time and grid parameters. Points represent median drift in individual simulations. **(B)** The total number of place

cells (CA1 cells with place fields) versus time and the plasticity rate taken during the late phase (after plasticity) on each day. (**A-B**) N=10 simulations per condition. Hebbian plasticity steps were omitted in the “No LTP” condition. Error bars represent the mean \pm the standard error of the mean.