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Remapping Of Place Cell Firing

Place cells have the ability to suddenly change their firing pattern from one pattern to another, a phenomenon known as remapping. This remapping may occur in either some of the place cells, or in all place cells at once. It may be caused by a number of changes, such as a change in the odor of the environment.

Place cell - Wikipedia

1.4. "Remapping" in Grid Cells. Like place cells, grid cells change their firing patterns following environmental change [2, 30], but the exact nature of the remapping is different. As mentioned above, grid cells are always active, so they do not switch fields

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on and off as place cells do.

Place Cells, Grid Cells, Attractors, and Remapping

When place cells are recorded from rats running on an elevated T-maze inside a curtained enclosure that contains distinct, experimenter selected stimuli, rotations of the maze plus stimuli cause equal rotations of firing fields. Here, we examined the effects of conflicting rotations of a T-maze relative to a laboratory frame that contained a large number of fixed stimuli in the environment and ...

Remapping of place cell firing patterns after maze ...

Patients with Alzheimer's disease (AD) suffer from spatial memory impairment and wandering behavior, but the brain circuit mechanisms causing such sym...

Disrupted Place Cell Remapping and Impaired Grid Cells

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in ...

These firing rate changes in grid cells upon landmark manipulations, together with the hippocampal remapping caused by direct manipulation of MEC neuron activity, provide compelling evidence for an important role of grid cells and other MEC neurons in triggering hippocampal remapping.

Frontiers | Hippocampal Remapping and Its Entorhinal ...

Remapping refers to the formation of distinct representations in populations of place cells after minor changes in inputs to the hippocampus. Remapping might reflect processes involved generally in decorrelation of overlapping signals. These processes might be crucial for storing large numbers of similar experiences with only minimal interference.

**Understanding memory through hippocampal remapping:
Trends ...**

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There were no apparent differences in place cell firing or remapping behavior between the two versions of the recording arena. Before each trial, any extraneous matter (e.g., sawdust, fecal material) was removed, and the inner surfaces of the walls and floor of the recording box were liberally wiped with food-flavoring (lemon or vanilla).

Heterogeneous Modulation of Place Cell Firing by Changes ...

When place cells undergo rate remapping, simultaneously recorded grid cells do not change their firing in a consistent way.

3. Global (place) remapping: in some cases, environmental changes can change the position of the place fields in an unpredictable way.

Place Cell - an overview | ScienceDirect Topics

Remapping in place cells and grid cells. (Top left) John Kubie and

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Bob Muller in 1983. (Top right) Color-coded firing rate map for a hippocampal place cell from an early remapping experiment (purple, high rate; yellow, low rate). The cell fired at different locations in different versions of the recording cylinder, one with a black cue card and one with a white cue card.

Place Cells, Grid Cells, and Memory

Some principal cells in the MEC have sharply delineated firing fields that collectively signal an animal's current position in a small environment as accurately as place cells in the hippocampus 38.

Path integration and the neural basis of the 'cognitive ...

The spatial component of these computations includes the formation of independent maps by hippocampal place cells across environments, referred to as global remapping. Such remapping is thought to emerge by the switching of input

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patterns from specialized spatially selective cells in medial entorhinal cortex (mEC), such as grid and border cells.

Hippocampal Global Remapping Can Occur ... - Cell Reports

It is argued that the time-variant alteration of place cell firing fields observed following exposure to a novel stimulus in this study reflects an experience-dependent modification of place cell...

(PDF) Remapping of place cell firing patterns after maze

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environment is changed, some place cells can adjust by “remapping”, or altering their firing patterns. There are multiple sub-regions within the hippocampus.

Remapping of Place Cells in the Dorsal and Ventral ...

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New study, led by UCI School of Medicine's Kei Igarashi, PhD, found that remapping of place cells, a brain circuit function to discriminate distinct environments, was disrupted in Alzheimer's ...

Remapping of Place Cells [image] | EurekAlert! Science News

Moreover, the induction of long-term potentiation triggers the remapping of place cells 29. During exploration, place fields are likely to be stabilized through activity-dependent processes, as...

Activity-dependent plasticity of hippocampal place maps

...
Furthermore, electrophysiological recording of hippocampal place cells has revealed "remapping" in response to the changes in barriers that induced detours or shortcuts (Alvernhe et al., 2008 ...

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(PDF) Local remapping of place cell firing in the Tolman

...

Fear conditioning caused many place cells to alter (or remap) their preferred firing locations in the training environment, whereas most cells remained stable in the control environment. This finding indicates that aversive reinforcement can induce place cell remapping even when the environment itself remains unchanged.

Putting Fear in Its Place: Remapping of Hippocampal Place ...

ABSTRACT: Hippocampal place cells represent nonspatial information through a process called rate remapping, which involves a change in the firing rate of a place cell without changes in its spatial specificity. However, many hippocampal phenomena occur on very short time scales over which long-

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term average firing rates are not an appropriate description of activity.

Place Cells: Ji, Daoyun - Expertscape.com

If all place cells receive a unitary context signal, then each environment should elicit a completely new representation and all of the cells should remap together. If different cells receive different elements of the compound context, then only a subset of cells should remap. Such partial remapping to a nonspatial sensory

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