

# Remapping Of Place Cell Firing Patterns After Maze Rotations

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After maze rotations of 90 degrees, 180 degrees or 270 degrees, firing fields were stable in the laboratory frame and thus shifted to a different maze arm.

Exp Brain Res (2002) 143:470–479 DOI 10.1007/s00221-002-1013-0 R E S E A R C H A R T I C L E Arnaud Cressant · Robert U. Muller · Bruno Poucet  
**Remapping Of Place Cell Firing Patterns After Maze Rotations** Received: 10 October 2001 / Accepted: 12 December 2001 / Published online: 20 February 2002 © Springer-Verlag 2002 Abstract When place cells are recorded from rats run- the possible paths the animal can take in the environ- ning on an elevated T-maze ...

**Remapping Of Place Cell Firing Patterns After Maze Rotations** . By Arnaud Cressant, Robert U. Muller and Bruno Poucet. Cite . BibTex; Full citation; Publisher: Springer Science and Business Media LLC. Year: 2003. DOI identifier: 10.1007/s00221-002-1013-0. OAI identifier: Provided by: ...

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A Cressant, Ru Muller, Bruno Poucet. **Remapping Of Place Cell Firing Patterns After Maze Rotations**. Experimental Brain Research, Springer Verlag, 2002, 143 (4), pp.470-479. 10.1007/s00221-002-1013-0 .

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4/1/2018 · (A) Global remapping. Place cells are recorded in environments of different shape (square or circular; Muller and Kubie, 1987). Place cells active in one environment are silent in the other environment, or active at a different location. The active ensemble is unique to the environment. (B) Partial remapping.

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representations of different consequences associated with similar stimuli.

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The place cells also remap, with, in this example, two cells switching fields off, two switching them on and one shifting its field to a new location in the enclosure. ...

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21/7/2020 · Place cells in the hippocampus exhibit distinct spike patterns in different environments, a circuit function called remapping. Jun et al. show that remapping is disrupted in the APP knockin mouse model, suggesting that remapping impairment is a circuit mechanism underlying spatial memory impairment in Alzheimer's disease.

14/11/2007 · Place cells in CA1, in contrast, display discordant behaviors (e.g., rotating with different sets of cues or remapping) in the same condition. In addition, on average, CA3 place cells shift their firing locations (measured by the center of mass, or COM) backward over time when the animal encounters the changed environment for the first time, but not after that first experience.

1/2/2017 · Spatial firing patterns re-appeared after a 2–6-h recovery period. However, these post-injection firing patterns differed from those before ZIP injection in ways that mimicked remapping. These results suggest that PKM $\theta$ , and presumably the maintenance of LTP, is essential for maintaining stable spatial firing patterns of place cells. 12.

9/6/2020 · Initially, the place cell representation split, some following room cues and some following maze cues. However, after a few repetitions, the place cell

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30/6/2004 · Cressant, A., Muller, R. U. & Poucet, B. **Remapping Of Place Cell Firing Patterns After Maze Rotations**. *Exp. Brain Res.* 143, 470–479 (2002)  
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Remapping in place cells, showing red spikes superimposed on the black path of the rat, as in Figure 3. (A) Rate remapping, in which some cells appeared to differentiate the compartments by varying their firing rate. (B) The response of 3 cells to the context-change ...

Cell 1: a comparison of the left and right panels illustrates rate remapping, where place cell firing rates change with contextual cues (i.e., vanilla or lemon odour); whereas a comparison of the top and bottom panels illustrates global remapping, where place cells change their firing locations between different environments (i.e., black or white walls) (adapted from [57]).

The exact function of different entorhinal cell types in place-cell formation remains to be determined, but it is not unlikely that individual place cells receive inputs from both grid and border cells, possibly with grid cells providing self-motion-based distance information and border cells providing position in relation to geometric boundaries (Bush et al. 2014; Zhang et al. 2014).

21/2/2012 · A long unresolved problem with the mainly allocentric view of hippocampal place cells has been that whereas, in an open environment, a large majority of place cells exhibit firing that is not direction specific (Muller et al., 1994; Markus et al., 1995), on a track that is repeatedly traversed along a specific path, the activity of place cells in each direction differs substantially ...

of experience, the place cell representations of two environments of different shape gradually diverge (Lever et al., 2002), such that the final representations can be said to have 'remapped' (Muller and Kubie, 1987). After 'remapping' a given cell might fire in only one of the environments, or might fire in both but in unrelated locations.

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...

11/8/2020 · Our previous observation that place cell inputs induce variability in firing rates of single grid cells across different firing fields, led us to examine whether the rank order of grid fields according to peak firing changes under the modification of place cell firing patterns associated with grid cell depolarization (similar rank changes have been observed also under place cell rate remapping, but in ...

place cells ravikrishnan P. Jayakumar 1,6, Manu S. Madhav 2,6\*, Francesco Savelli 2, Hugh t. Blair 3, Noah J. Cowan 1,4,7 & James J. Knierim 2,5,7  
Hippocampal place cells are spatially tuned neurons that serve as elements of a 'cognitive map' in the mammalian brain<sup>1</sup>. To detect the animal's location, place cells are thought to rely upon

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7/9/2016 · Both rotated and nonrotated spatial correlations are greater than a simulated global remapping situation (Fig. 4D shows a random remapping simulation), in which the fields in one direction were rotated randomly along the track (each cell's fields rotated a different random amount, repeated 1000 times:  $0.0014 \pm 0.098$ , compared with shifted bins, t test, one-tailed: p

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rotated 90 degrees in opposite directions. Initially, the place cell representation split, some following room cues and some following maze cues. However, after a few repetitions, the place cell representation remapped between the two conditions. This is reminiscent of the simulations in Fig. 3, where a particular cue manipulation

grid cell firing patterns were spatially expanded and less regular in novel arenas than in a similarly sized familiar arena. At the same time, place cell firing patterns remapped and increased in size. Repeated exposure to the novel arenas produced an attenuation of these effects. Results Experiment 1: Spatial Scale of Grid Cell Firing ...

Further, a prominent view on place cells is that their location-specific firing arises from boundary vector cells—cells which fire at a specific distance and

direction relative to a border within an environment (Barry et al., 2006; Lever et al., 2009; Solstad et al., 2008).

1/9/2004 · Hippocampal place cells are selectively active when a rat occupies restricted locations in an environment, and head direction cells fire selectively when the rat's head is pointed in a particular direction in allocentric space. Both place cells and head direction cells are usually coupled, and they are controlled by a complex interaction between external landmarks and idiothetic cues.

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For example, one model describes how the multi-peaked firing of grid cells may be transformed into the single-peaked firing of hippocampal place cells. The model theorizes how inputs from grid cells onto place cells may be selected and how place fields may develop in a novel environment as a result of plasticity in the network (Savelli et al., PDF Document: 2010 ).

multiple firing locations, unlike the place cell. The spatial firing fields were arranged at equal distances apart from one another, suggesting that these cells encode a cognitive representation of Euclidean space. Grid cells were named because their hexagonal firing pattern created a triangular grid of tessellated triangles.

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