

Accepted Manuscript

Title: Representational specializations of the hippocampus in phylogenetic perspective

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PII: S0304-3940(17)30378-6
DOI: <http://dx.doi.org/doi:10.1016/j.neulet.2017.04.065>
Reference: NSL 32807

To appear in: *Neuroscience Letters*

Received date: 4-1-2017
Revised date: 28-4-2017
Accepted date: 29-4-2017

Please cite this article as: Elisabeth A.Murray, Steven P.Wise, Kim S.Graham, Representational specializations of the hippocampus in phylogenetic perspective, *Neuroscience Letters* <http://dx.doi.org/10.1016/j.neulet.2017.04.065>

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 <AU>Elisabeth A. Murray, Steven P. Wise and Kim S. Graham
 <AFF>Special issue of Neuroscience Letters
 <AFF>*Hippocampal function in memory and cognition: controversies and new perspectives*
 <AFF>Mariam Aly and Charan Ranganath, editors

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<ABS-HEAD>HIGHLIGHTS ► A homologue of the hippocampus emerged in early vertebrates.
 ► It provided these mobile ancestors with representations that supported navigation. ► These
 representations also enabled non-navigational functions, *e.g.*, serial order. ► Among primates,
 anthropoids came to use foveal vision for foraging at a distance. ► This trait favored
 representations for perceiving and remembering visual scenes.

<ABS-HEAD>ABSTRACT

<ABS-P>In a major evolutionary transition that occurred more than 520 million years ago, the
 earliest vertebrates adapted to a life of mobile, predatory foraging guided by distance receptors
 concentrated on their heads. Vision and olfaction served as the principal sensory systems for
 guiding their search for nutrients and safe haven. Among their neural innovations, these animals
 had a telencephalon that included a homologue of the hippocampus. Experiments on goldfish,
 turtles, lizards, rodents, macaque monkeys and humans have provided insight into the initial
 adaptive advantages provided by the hippocampus homologue. These findings indicate that it
 housed specialized map-like representations of odors and sights encountered at various locations
 in an animal's home range, including the order and timing in which they should be encountered
 during a journey. Once these representations emerged in early vertebrates, they also enabled a
 variety of behaviors beyond navigation. In modern rodents and primates, for example, the
 specialized representations of the hippocampus enable the learning and performance of tasks
 involving serial order, timing, recency, relations, sequences of events and behavioral contexts.
 During primate evolution, certain aspects of these representations gained particular prominence,
 in part due to the advent of foveal vision in haplorhines. As anthropoid primates—the ancestors
 of monkeys, apes and humans—changed from small, nocturnal animals that foraged locally into
 large, diurnal ones with an extensive home range, they made foraging choices at a distance based
 on visual scenes.

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