

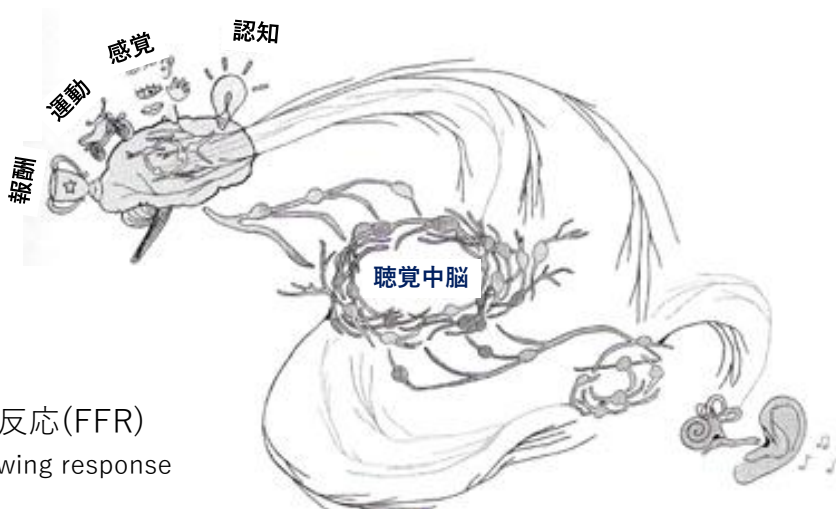
運動神経系(2024.4.14)



横地健治

1

聴覚中脳

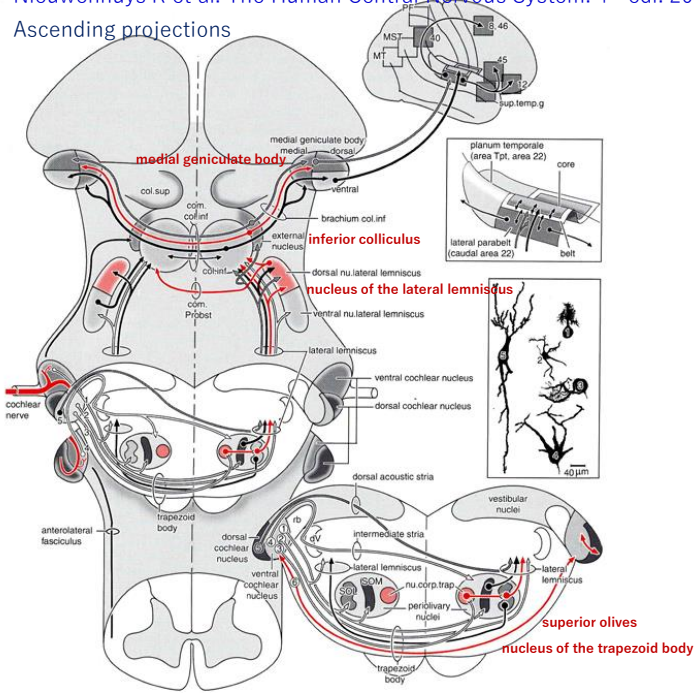


周波数対応反応(FFR)
Frequency following response

ニーナ・クラウス 「音と脳」
Nina Kraus. Of Sound Mind. 2021

2

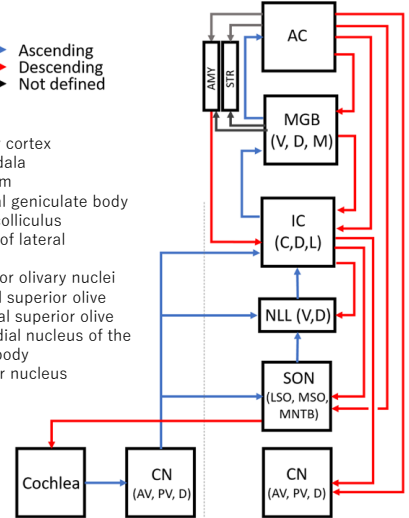
Ascending projections



Mammalian Auditory System:

- Ascending
- Descending
- Not defined

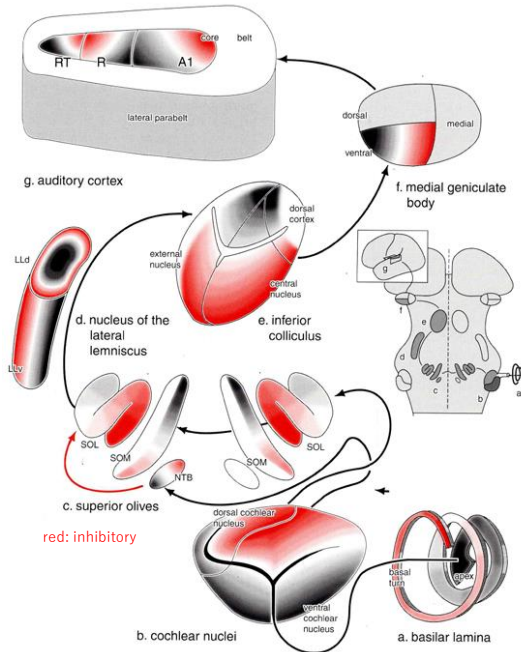
AC: auditory cortex
AMY: amygdala
STR: striatum
MGB: medial geniculate body
IC: inferior colliculus
NLL: nuclei of lateral lemniscus
SON: superior olivary nuclei
LSO: lateral superior olive
MSO: medial superior olive
MNTB: medial nucleus of the trapezoid body
CN: cochlear nucleus



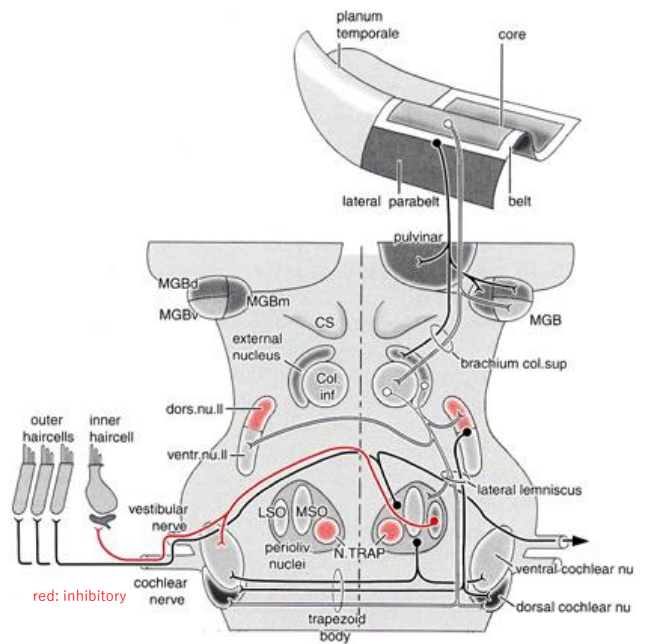
Macias S, Llano DA. Descending projections to the auditory midbrain: evolutionary considerations. J Comp Physiol A Neuroethol Sens Neural Behav Physiol 2023;209:131-143.

3

Tonotopic organization



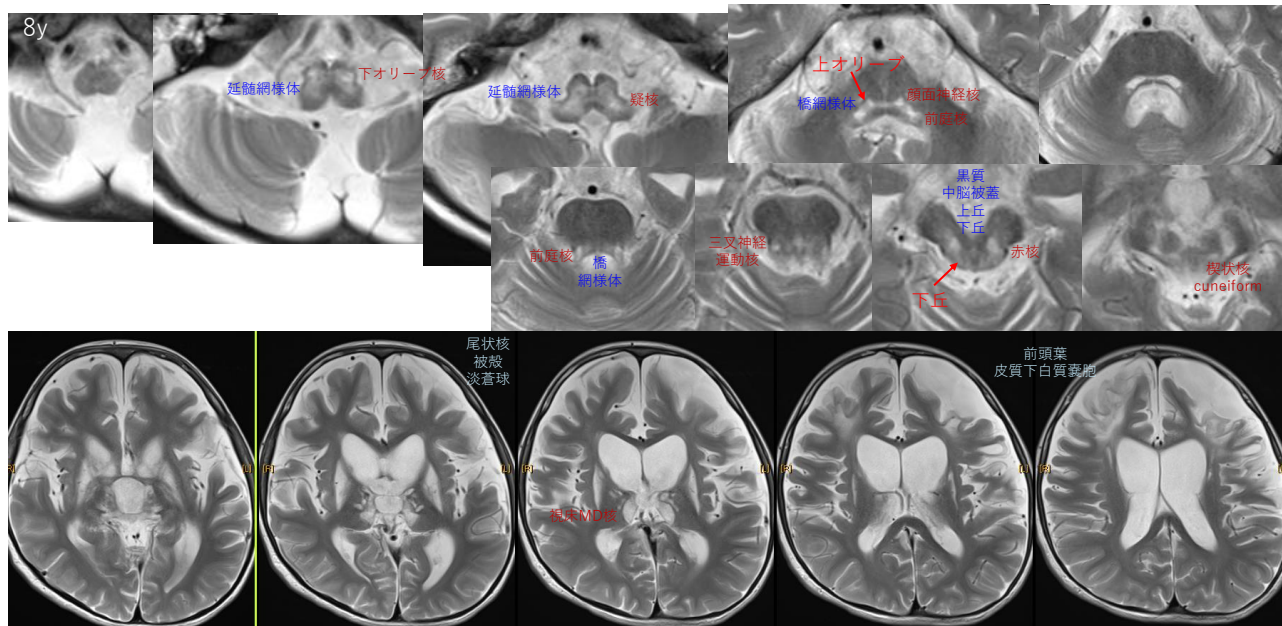
Descending connections



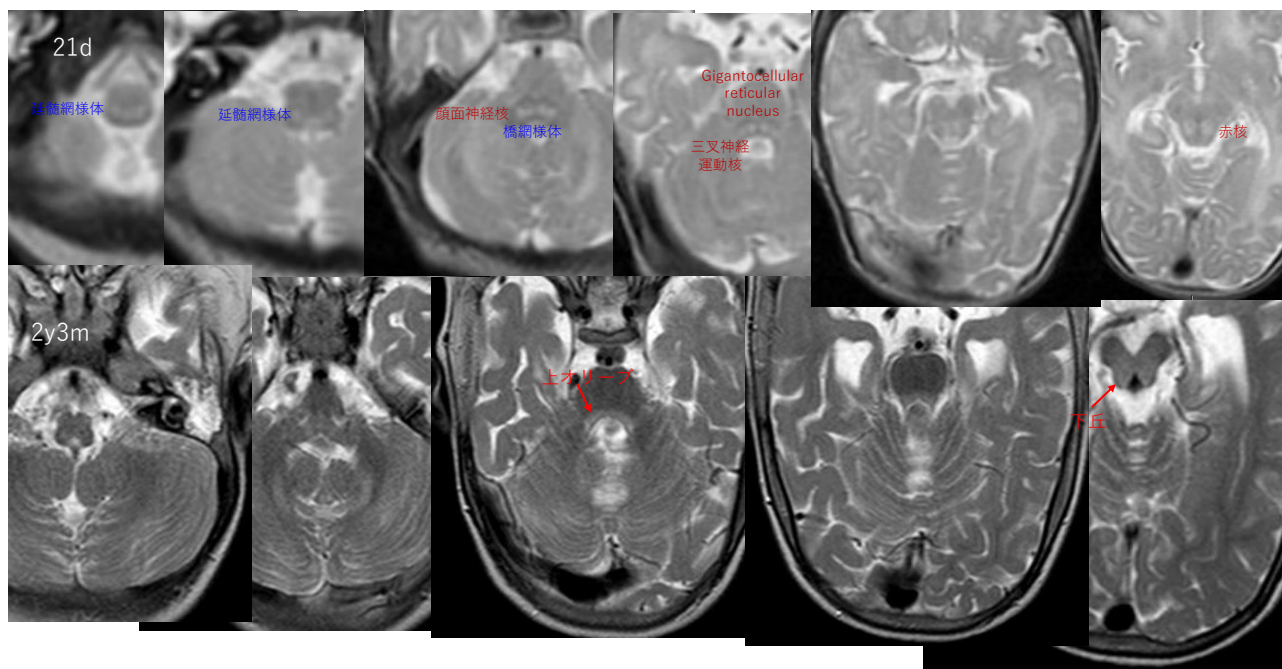
4

ミトコンドリア遺伝子変異病の横地分類A1-C

幼児期に進行したエネルギー産生系の破綻

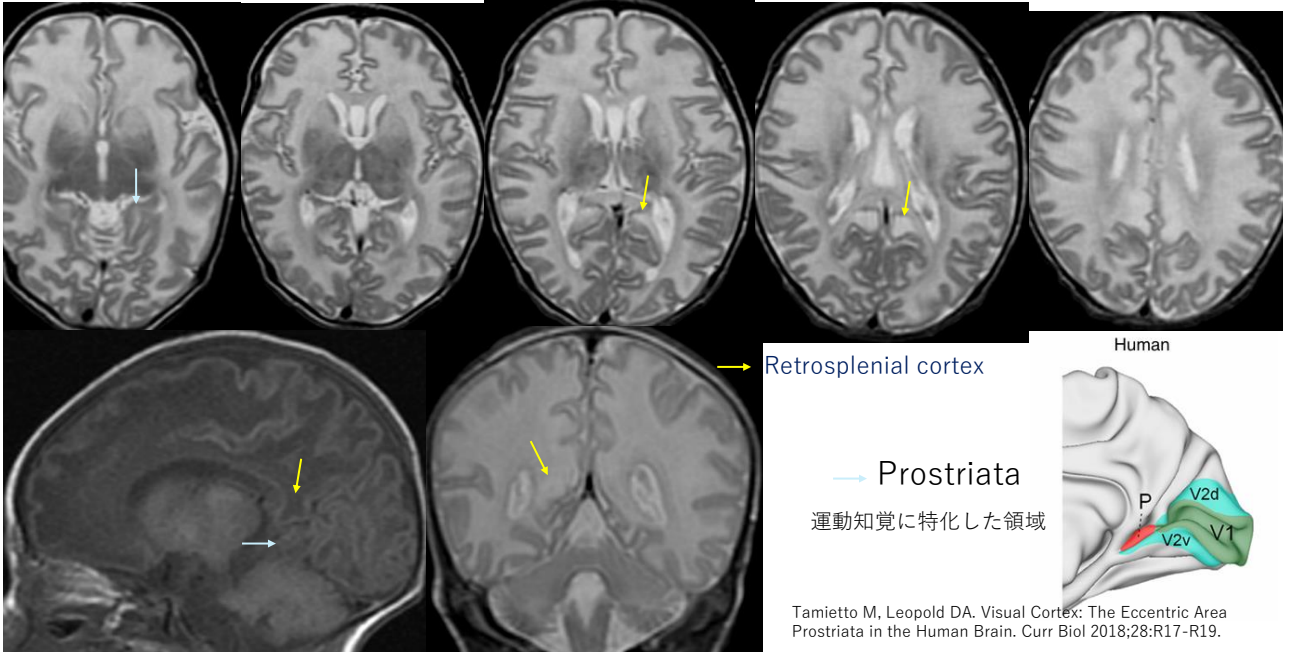


5

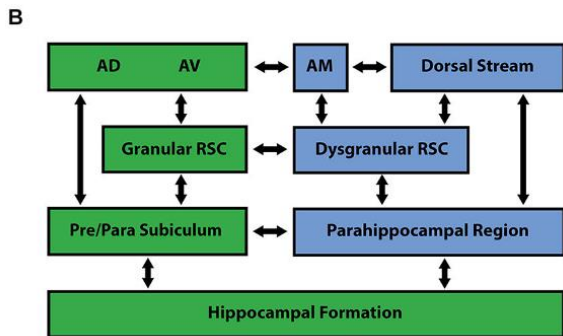
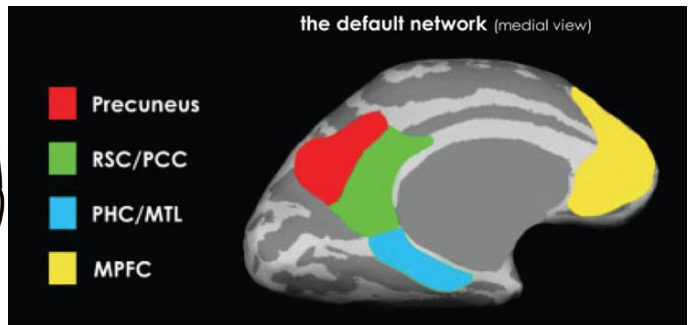
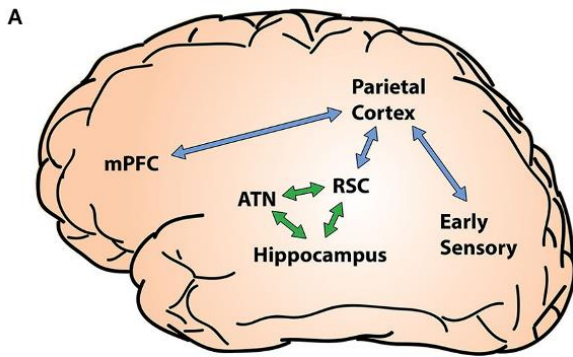


6

Retrosplenial cortex



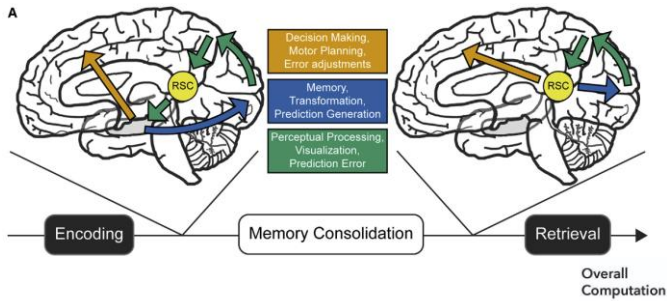
7



Precuneus
RSC: retrosplenial cortex
PCC: posterior cingulate cortex
PHC: parahippocampal cortex
MTL: medial temporal lobe
MPFC: medial prefrontal cortex

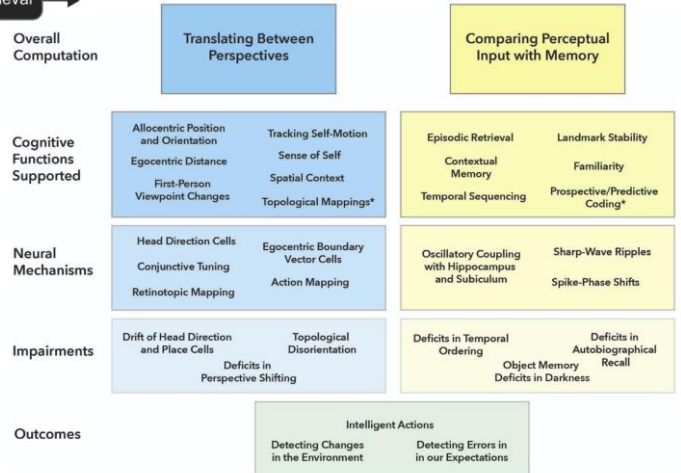
Miller AMP, et al. Cues, context, and long-term memory: the role of the retrosplenial cortex in spatial cognition. Front Hum Neurosci 2014;8:586.

8



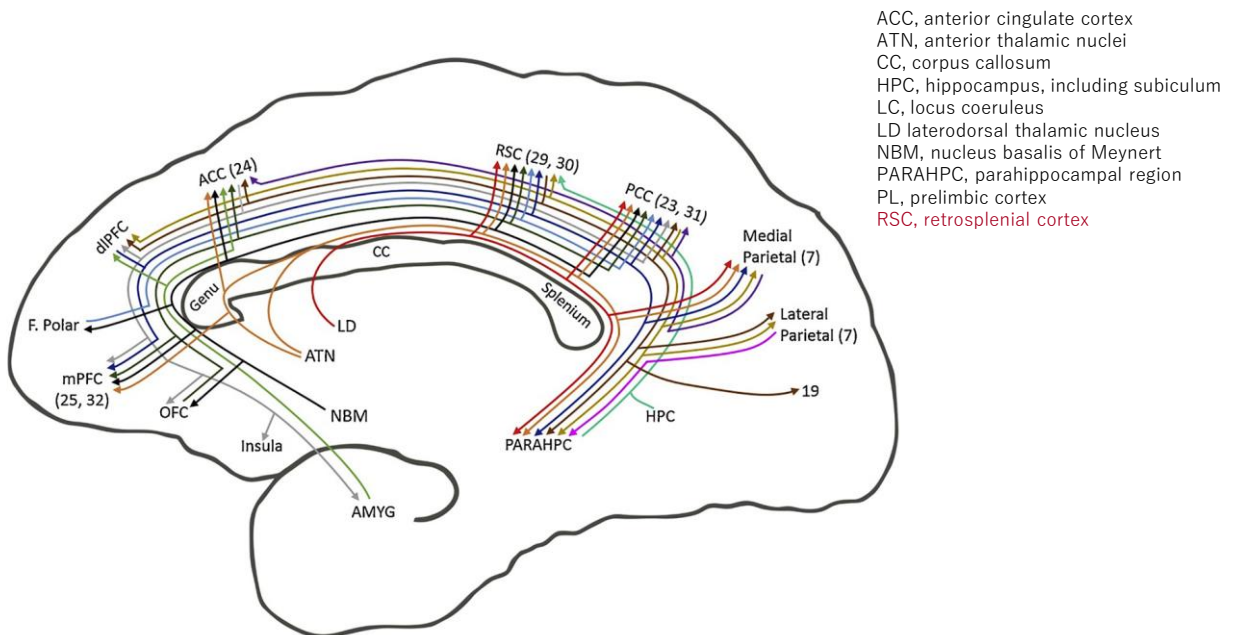
Andrew S Alexander AS, et al. Rethinking retrosplenial cortex: Perspectives and predictions. *Neuron* 2023;111:150-175.

記憶と空間認識



9

Bubb EJ, et al. The **cingulum bundle**: Anatomy, function, and dysfunction. *Neurosci Biobehav Rev* 2018;92:104-127.



ACC, anterior cingulate cortex
 ATN, anterior thalamic nuclei
 CC, corpus callosum
 HPC, hippocampus, including subiculum
 LC, locus coeruleus
 LD laterodorsal thalamic nucleus
 NBM, nucleus basalis of Meynert
 PARAHPC, parahippocampal region
 PL, prelimbic cortex
 RSC, retrosplenial cortex

10

Table 1

Comparison of cingulum bundle (CB) lesion effects in rats with other, related brain sites. Symbols: * results from same study as cingulum bundle lesion; √, no lesion effect; X, mild/borderline effect; XX, clear deficit; XXX, severe deficit. Numbers in parenthesis show the number of cingulum lesions in each hemisphere. In two studies (Neave et al., 1996, 1997) there were two groups with cingulum bundle lesions, which differed in the number of lesion placements per hemisphere (one, CB1 or two, CB2). In both studies, the lesions were placed asymmetrically to avoid bilateral cortical damage.

Task	Cingulum Bundle study	Cingulum Bundle	Retrosplenial Cortex	Anterior Thalamic Nuclei	Fornix	Anterior Cingulate
<u>Water-maze reference acquisition</u>	Warburton et al. 1998 (2)	X	X ¹ X ⁶	XXX ²	XX* XX ² XXX ¹²	X*
<u>Water-maze working</u>	Harker and Whishaw 2004 (1)	X	X*			
<u>T-maze alternation acquisition</u>	Harker and Whishaw 2004 (1)	X	X* X ¹	XXX ¹⁵	XXX ¹⁴	
	Aggleton et al. 1995 (3)	XXX	√* (ant + post cingulate) X ⁸ √ ¹⁰	XXX ³ XXX ⁷	XXX* XXX ⁷	√ ¹⁰ X ¹³ marginal
	Neave et al. 1996 (2,1)	X CB2 X CB1				
	Neave et al. 1997 (2,1)	XX CB2 √ CB1			XXX*	
<u>T-maze alternation delays</u>	Warburton et al. 1998 (2)	X			XXX*	
	Aggleton et al. 1995 (3)	XX	√* (ant + post cingulate) √ ¹⁰	XX ³ XXX ⁴	XXX ^{3,4}	√ ¹⁰
	Neave et al. 1996 (2,1)	√ CB2 √ CB1 (X when groups combined)				
Cross-maze alternation	Neave et al. 1997 (2,1)	√ CB2 √ CB1		XXX ⁴	XXX*	
Delayed nonmatch to position in operant box	Aggleton et al. 1995 (3)	√	√* (ant + post cingulate)	XX ⁵	XX*	√ ¹⁰
	Neave et al. 1996 (2,1)	√ CB2 √ CB1				
Lever discrimination and reversals	Aggleton et al. 1995 (3)	√	√* (ant + post cingulate)		XX*	√ ¹⁰
<u>Radial arm maze (working)</u>	Neave et al. 1997 (2,1)	XX CB2 √ CB1	XX ⁶	XXX ⁹	XXX*	√ ¹¹
Object recognition	Ennaceur et al. 1997 (3)	√	√* √ ⁶	√ ²	√*	√*
Object location recognition	Ennaceur et al. 1997 (3)	√	XX* (ant + post cingulate)		XX*	

The superscript numbers refer to appropriate comparison studies: 1. later reanalysis in Vann et al., 2003; 2. Warburton and Aggleton, 1999; 3. Aggleton et al., 1995; 4. Warburton et al., 1997; 5. Aggleton et al., 1991; 6. Vann and Aggleton, 2002; 7. Warburton et al., 1999; 8. Nelson et al., 2015; 9. Aggleton et al., 1996; 10. Neave et al., 1994; 11. Ragozzino et al., 1998; 12. Sutherland and Rodriguez, 1989; 13. Sánchez-Santed et al., 1997; 14. Cassel et al., 1998; 15. Perry et al., 2018.