

Harmonization of protocols for the manual tracing of the hippocampus - an EADC-ADNI joint effort

AUTHOR-CERTIFIED PROTOCOL FEATURES AND TRACINGS

deToledo-Morrell L, Stoub TR, Bulgakova M et al. MRI-derived entorhinal volume is a good predictor of conversion from MCI to AD. Neurobiol of aging 2004; 25:1197-203.

In the following section you can find:

- 1) An excerpt of the Survey of anatomical landmarks according to deToledo-Morrell et al.'s criteria.
- 2)The hippocampal tracing on consecutive coronal slices of a 1.5T ADNI control subject (**2A**) and AD patient (**2B**).

1) Excerpt of the Survey of anatomical landmarks according to deToledo-Morrell et al.'s criteria.

Plane			
axis of hippocampus			
Start tracing			
from head to tail			
Areas explicitly included	Areas explicitly excluded	Most anterior slice	Most posterior slice
fimbria, alveus, dentate gyrus, hippocampus proper and subiculum	fornix, amygdala, entorhinal cortex, posterior cerebral artery, head of the caudate	where the hippocampus could be clearly differentiated from the amygdala by the alveus	slice before the full appearance of the fornix
BOUNDARIES			
Lateral border	Inferior border	Medial border	Superior border
HEAD temporal horn of the lateral ventricle, white matter of the temporal stem	white matter of the parahippocampal gyrus, entorhinal cortex (horizontal line from parahippocampal white matter to CSF of the cistern)	transverse fissure, crural cistern	amygdala, temporal horn of the lateral ventricle
BODY temporal horn of the lateral ventricle, white matter of the temporal stem	white matter of the parahippocampal gyrus, entorhinal cortex (horizontal line from parahippocampal white matter to CSF of the cistern)	transverse fissure, crural cistern	head of the caudate, temporal horn of the lateral ventricle/choroid plexus, transverse fissure
TAIL temporal horn of the lateral ventricle, white matter of the temporal stem	white matter of the parahippocampal gyrus, parahippocampal gyrus gray matter (horizontal line from parahippocampal white matter to CSF of the cistern)	transverse fissure, ambient cistern	temporal horn of the lateral ventricle/choroid plexus, transverse fissure, crus of fornix

2A)CTRL

Anatomical section	118	119	120	121	122
Native MRI					
Tracing					
Notes		<p>Most anterior slice: where the hippocampus could be clearly differentiated from the amygdala by the alveus</p> <p>Sagittal view</p>			<p>1=Temporal horn of the lateral ventricle 2=Parahippocampal gyrus 3=Hippocampal head 4=Amygdala 5=Alveus</p>

2A)CTRL

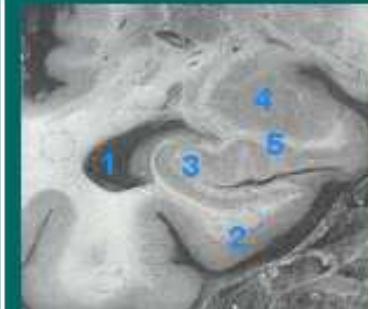
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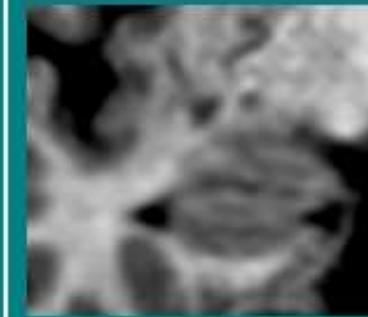
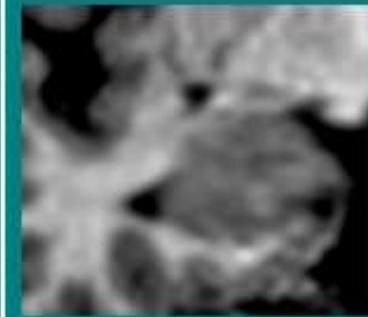
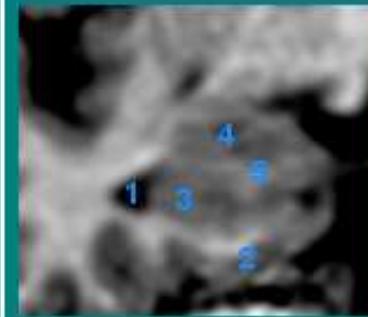
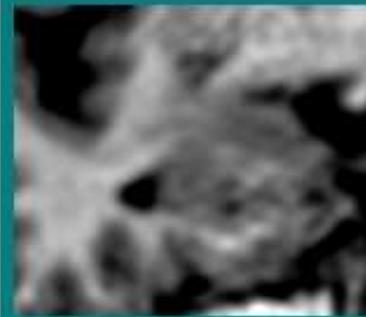
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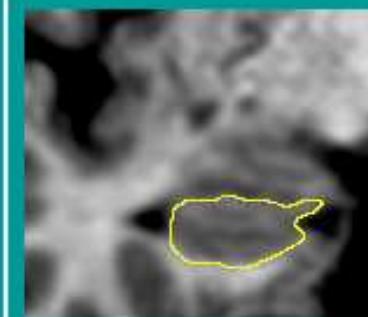
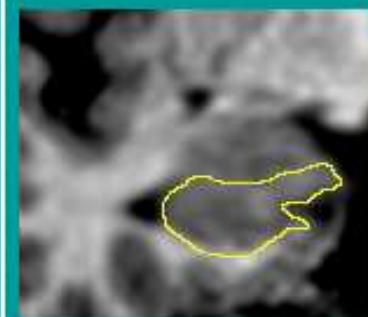
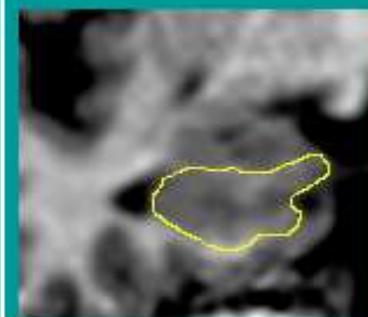
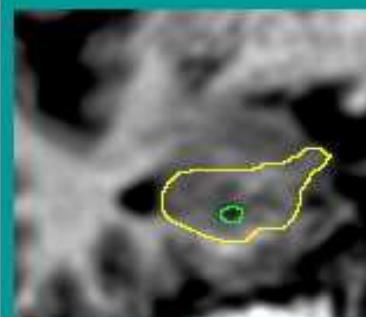
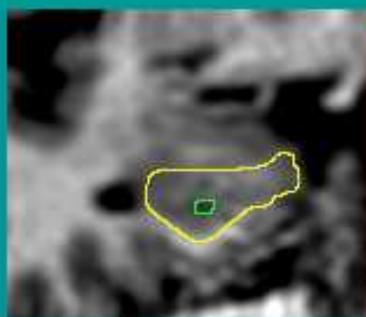
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Anatomical
section

Native MRI



Tracing



Notes

- 1=Temporal horn of the lateral ventricle
- 2=Parahippocampal gyrus
- 3=Hippocampal head
- 4=Amygdala
- 5=Alveus

2A)CTRL

128

129

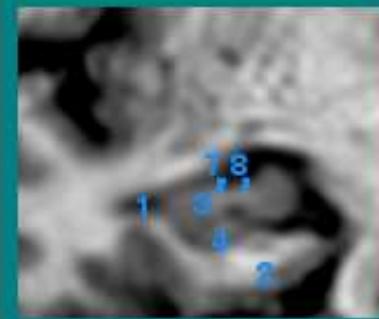
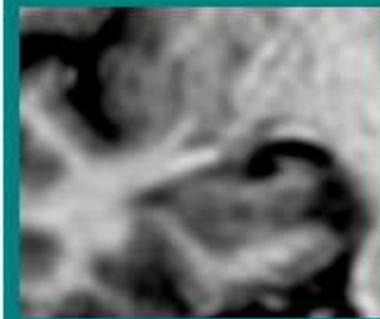
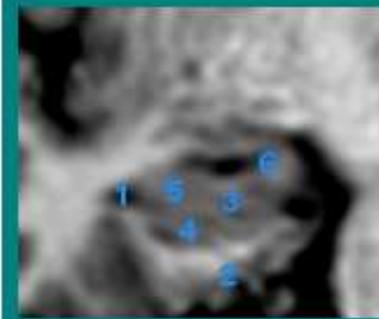
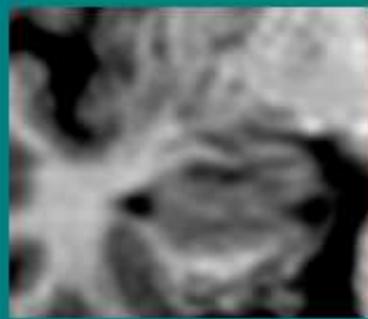
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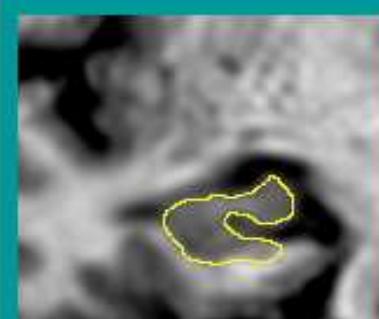
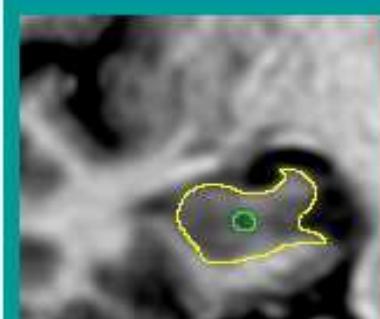
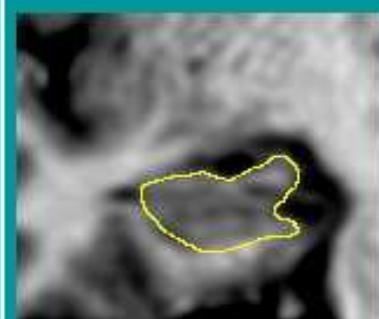
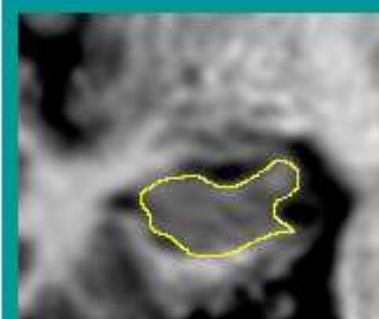
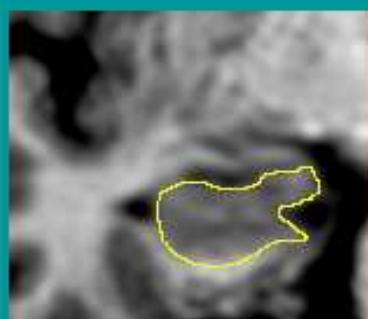
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Anatomical
section

Native MRI



Tracing



Notes

1=Temporal horn of the lateral ventricle
 2=Parahippocampal gyrus
 3=Gyrus dentatus
 4=Subiculum
 5=Cornu Ammonis
 6=Vertical digitation

1=Temporal horn of the lateral ventricle
 2=Parahippocampal gyrus
 3=Gyrus dentatus
 4=Subiculum
 7=Alveus
 8=Imbria

2A)CTRL

Anatomical section	133	134	135	136	137
Native MRI					
Tracing	A grayscale MRI slice showing a bright, irregularly shaped region outlined by a yellow polygonal tracing.	A grayscale MRI slice showing a bright, irregularly shaped region outlined by a yellow polygonal tracing.	A grayscale MRI slice showing a bright, irregularly shaped region outlined by a yellow polygonal tracing.	A grayscale MRI slice showing a bright, irregularly shaped region outlined by a yellow polygonal tracing.	A grayscale MRI slice showing a bright, irregularly shaped region outlined by a yellow polygonal tracing.
Notes					

2A)CTRL

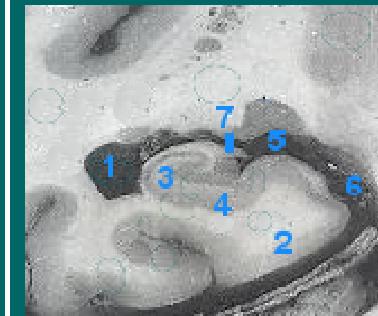
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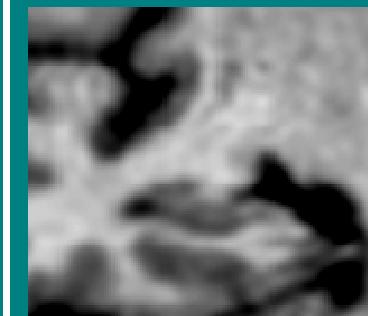
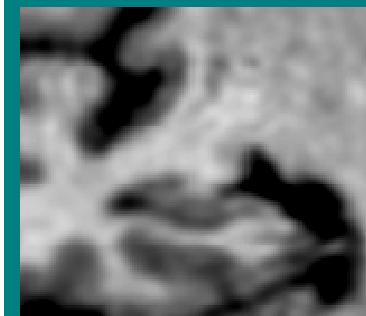
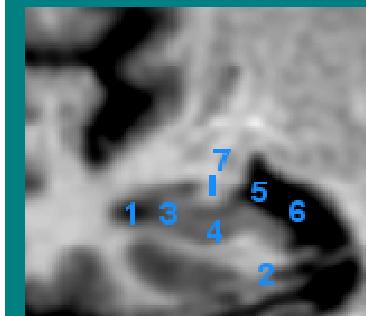
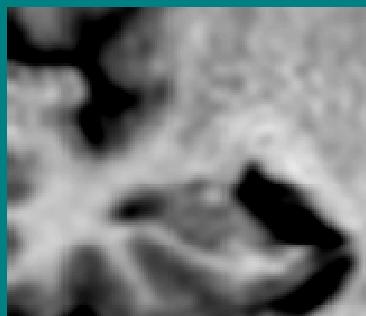
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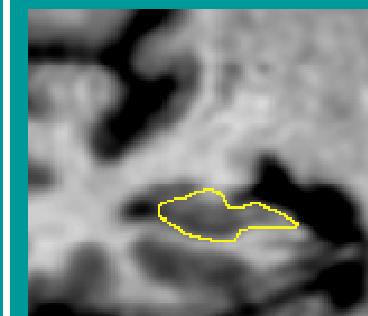
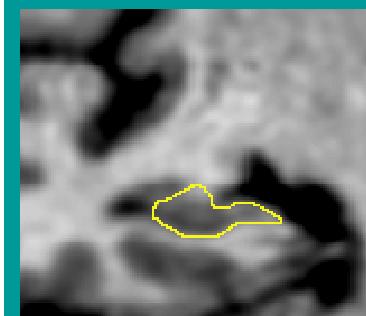
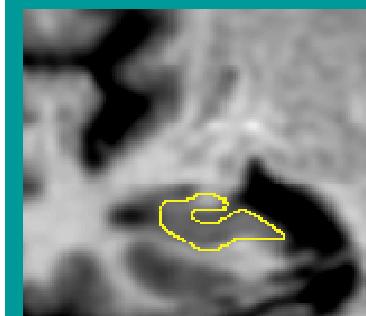
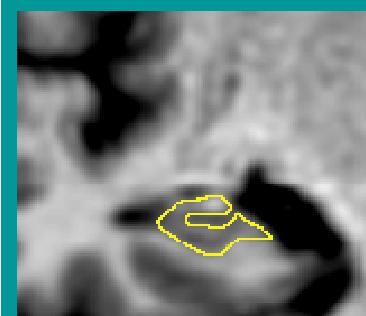
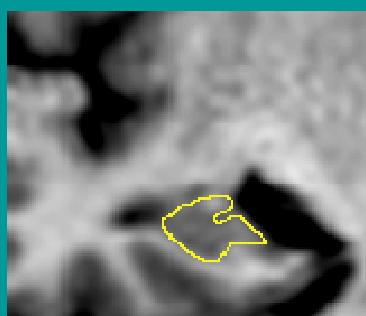
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Anatomical
section

Native MRI



Tracing



Notes

- 1=Temporal horn of the lateral ventricle
- 2=Parahippocampal gyrus
- 3=Gyrus dentatus
- 4=Subiculum
- 5=Choroidal fissure
- 6=Ambient cistern
- 7=Fimbria

2A)CTRL

Anatomical section	143	144	145	146	147
Native MRI					
Tracing					
Notes					

2A)CTRL

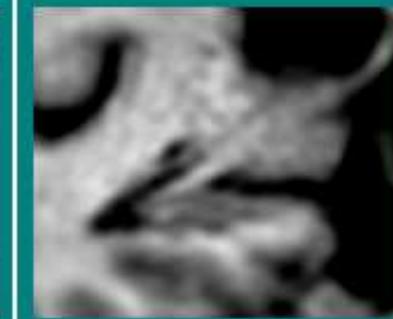
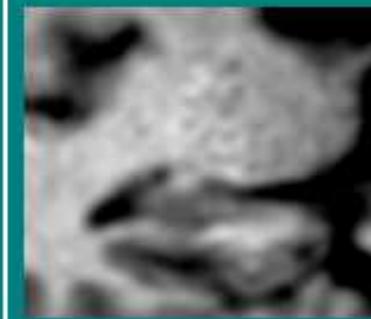
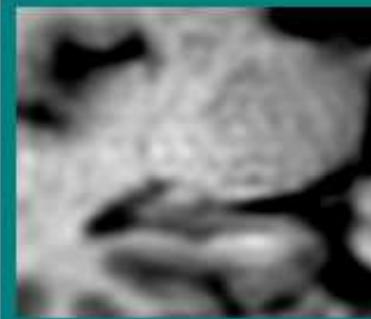
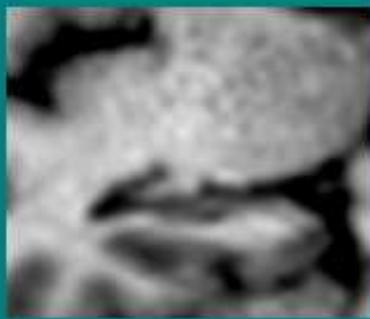
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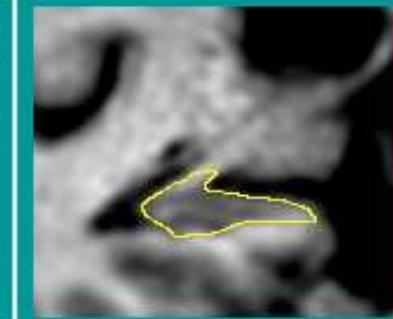
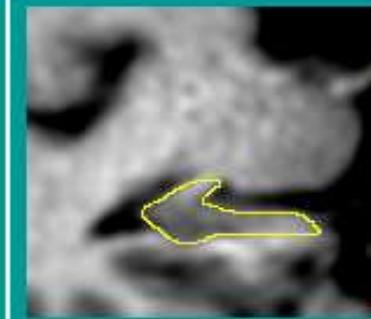
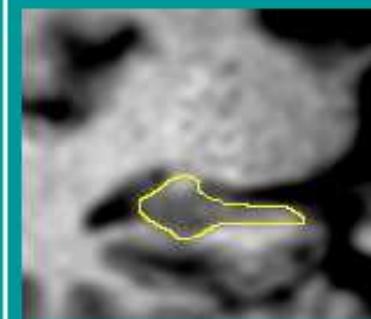
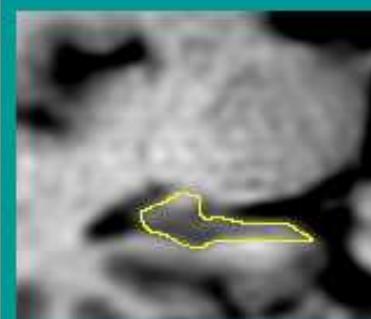
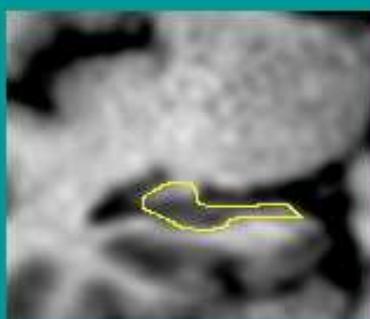
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Anatomical
section

Native MRI

Tracing

Notes



- 1=Temporal horn of the lateral ventricle
 2=Parahippocampal gyrus
 3=Gyrus dentatus
 4=Subiculum
 5=Pulvinar

Most posterior slice: slice before the full appearance of the fornix



2A)CTRL

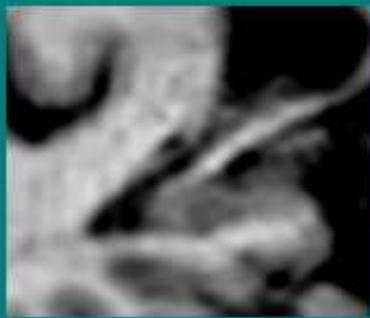
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156

157

Anatomical
section

Native MRI

Tracing

Notes

- 1=Temporal horn of the lateral ventricle
- 2=Cornu Ammonis
- 3=Gyrus dentatus
- 4=Fornix
- 5=Isthmus
- 6=Parahippocampal gyrus

2B) AD

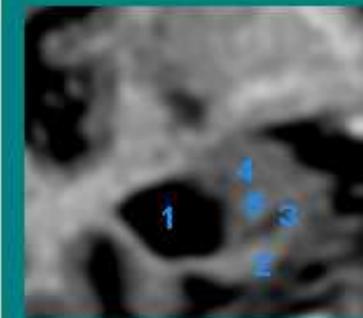
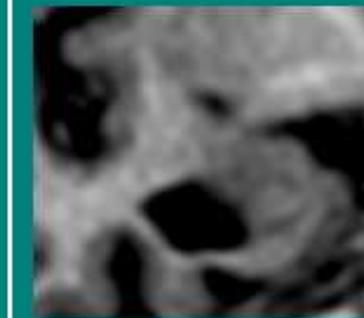
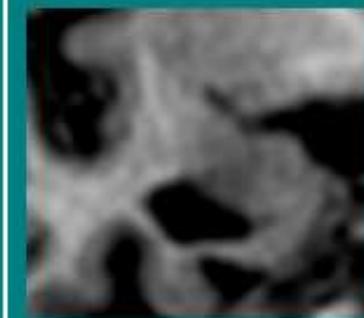
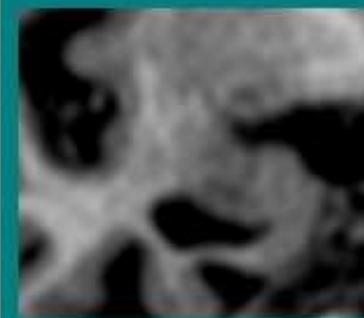
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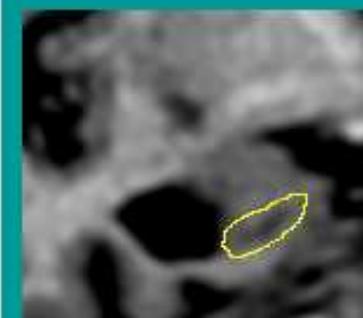
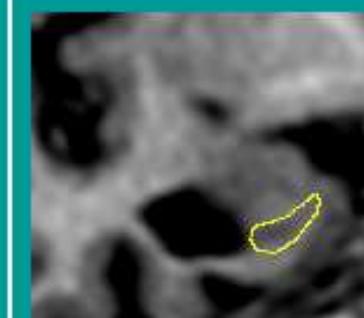
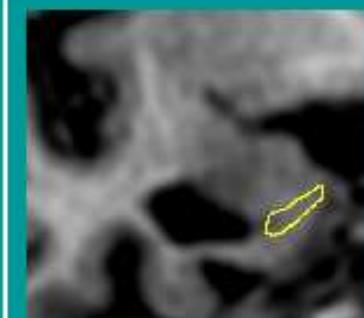
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Anatomical
section

Native MRI

Tracing

Notes



Most anterior slice: where the hippocampus could be clearly differentiated from the amygdala by the alveus



Sagittal
view

- 1=Temporal horn of the lateral ventricle
- 2=Parahippocampal gyrus
- 3=Hippocampal head
- 4=Amygdala
- 5=Alveus

2B) AD

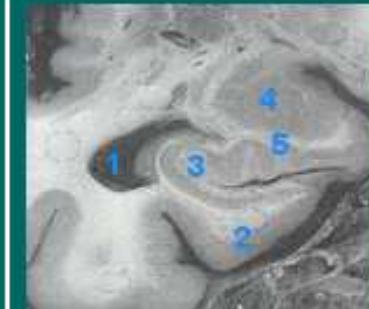
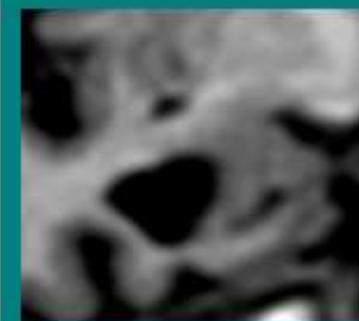
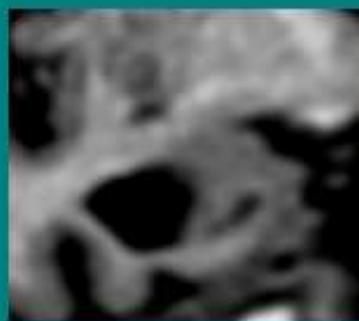
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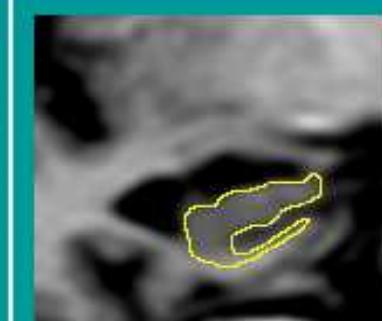
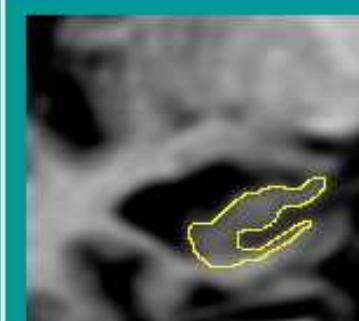
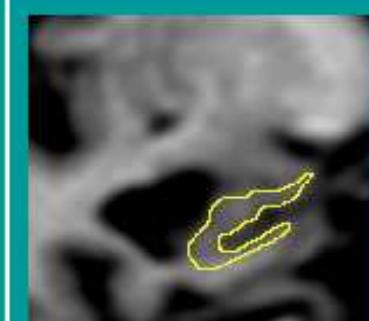
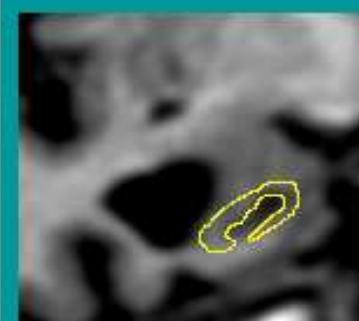
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Anatomical
section

Native MRI

Tracing

Notes



- 1=Temporal horn of the lateral ventricle
2=Parahippocampal gyrus
3=Hippocampal head
4=Amygdala
5=Alveus

2B) AD

Anatomical section

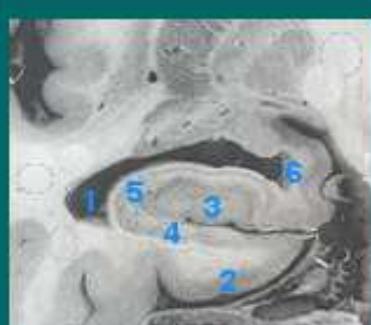
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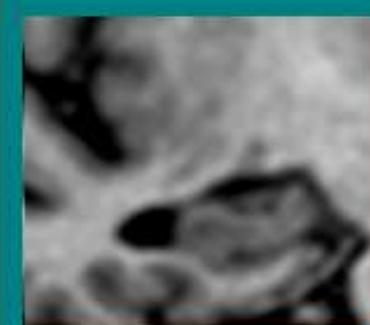
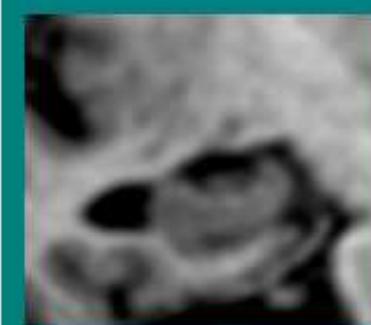
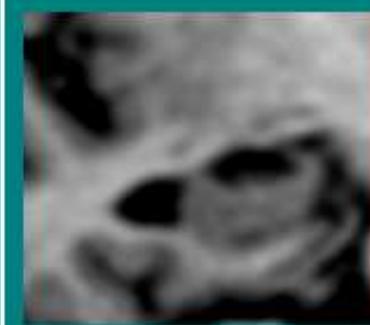
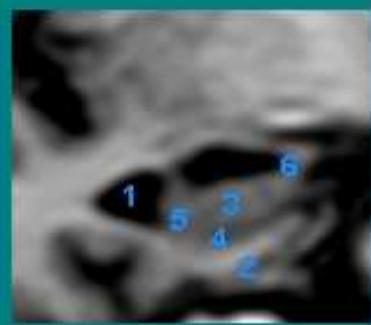
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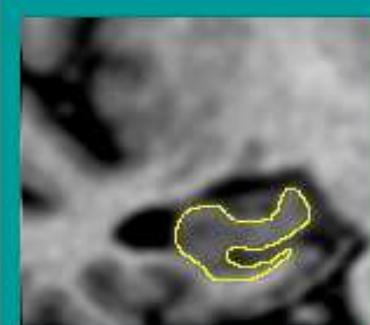
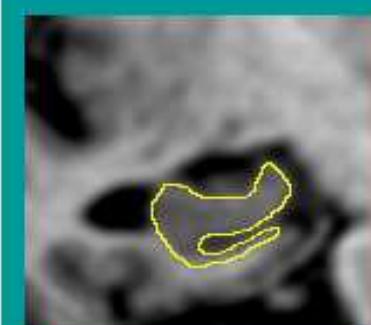
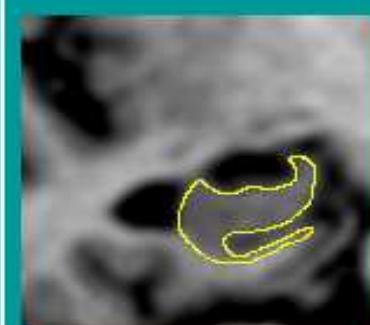
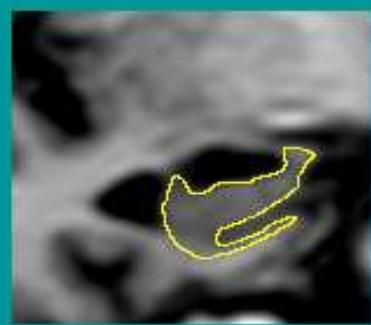
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Native MRI



Tracing



Notes

- 1=Temporal horn of the lateral ventricle
- 2=Parahippocampal gyrus
- 3=Gyrus dentatus
- 4=Subiculum
- 5=Cornu Ammonis
- 6=Vertical digitation

2B) AD

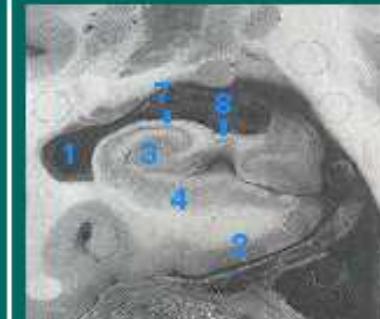
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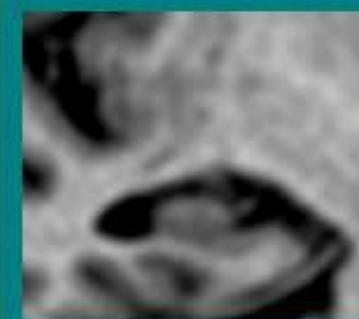
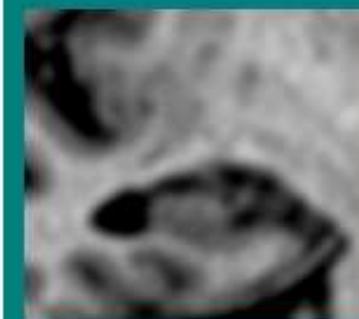
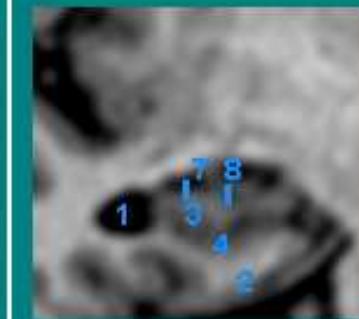
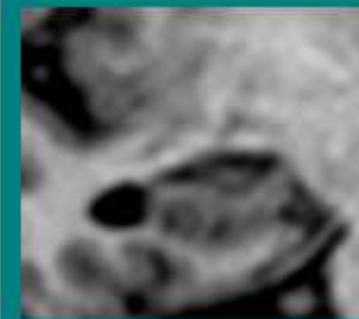
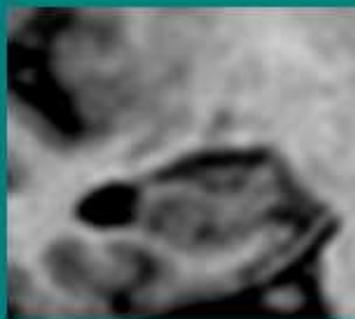
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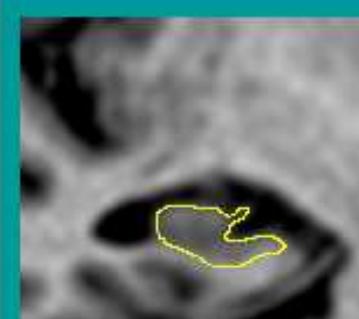
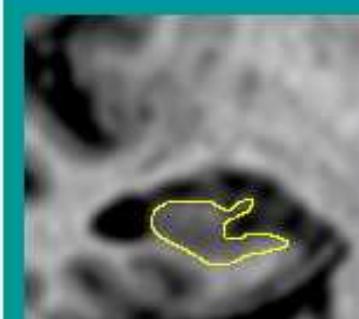
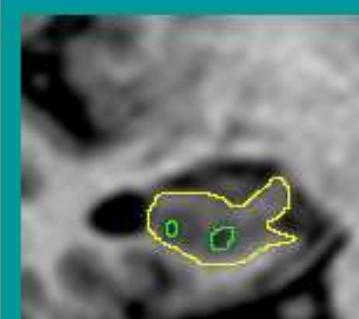
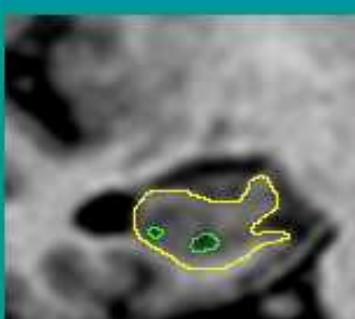
121

Anatomical
section

Native MRI



Tracing



Notes

- 1=Temporal horn of the lateral ventricle
- 2=Parahippocampal gyrus
- 3=Gyrus dentatus
- 4=Subiculum
- 7=Alveus
- 8=Imleria

2B) AD

Anatomical section	122	123	124	125	126
Native MRI					
Tracing					
Notes					

2B) AD

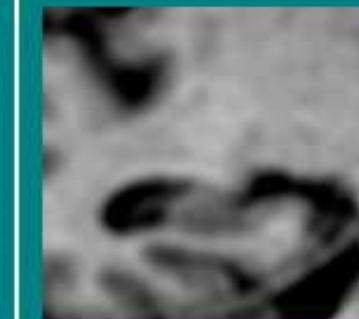
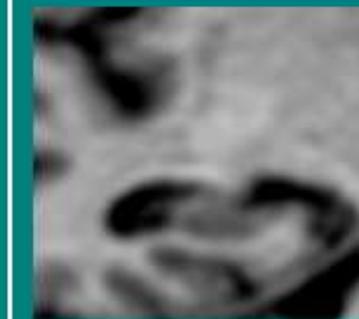
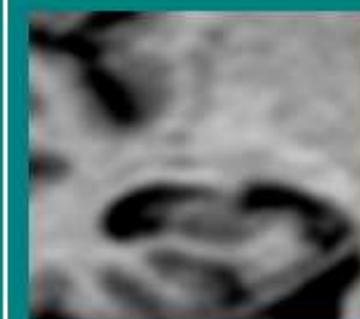
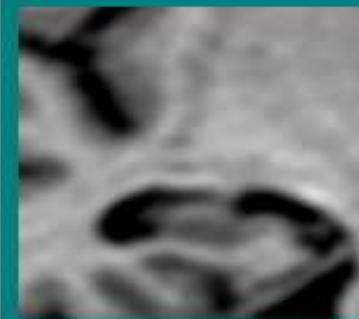
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128

129

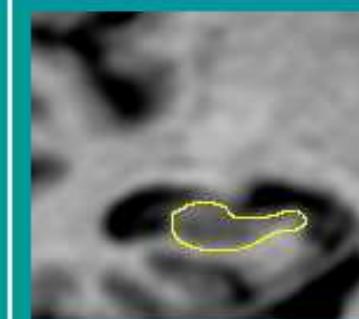
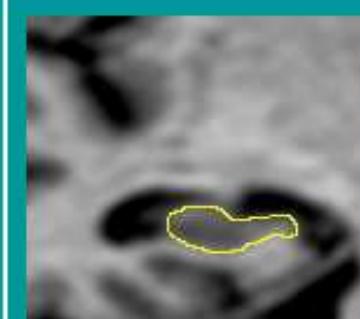
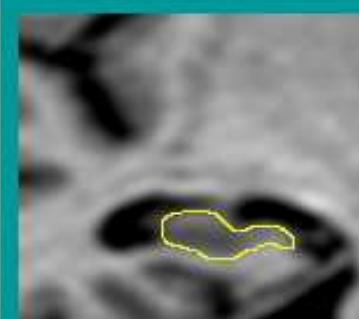
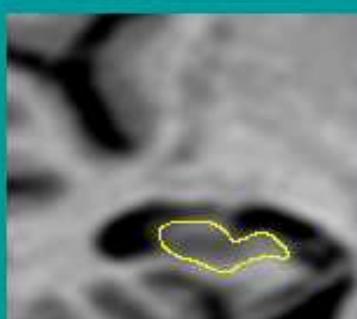
130

131

Anatomical
section

Native MRI

Tracing



Notes

- 1=Temporal horn of the lateral ventricle
- 2=Parahippocampal gyrus
- 3=Gyrus dentatus
- 4=Subiculum
- 5=Choroidal fissure
- 6=Ambient cistern
- 7=Fimbria

2B) AD

Anatomical section	132	133	134	135	136
Native MRI					
Tracing					
Notes					

2B) AD

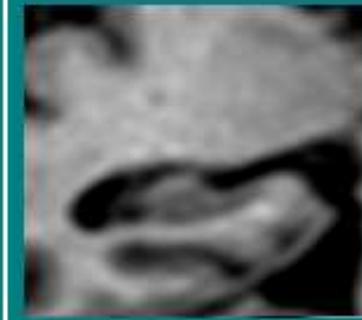
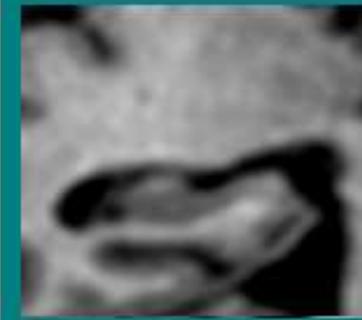
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138

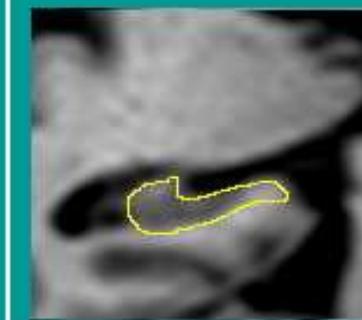
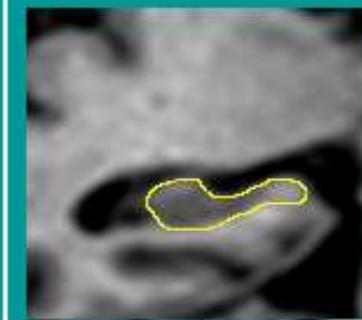
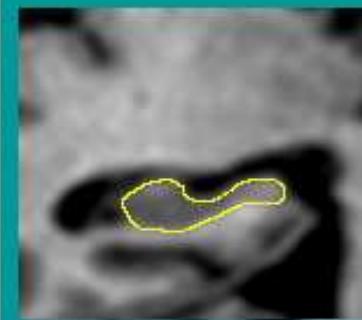
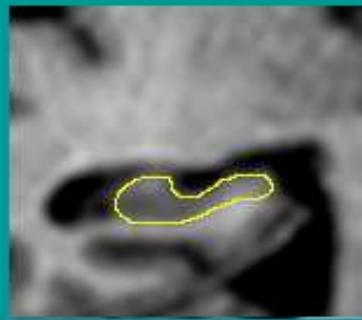
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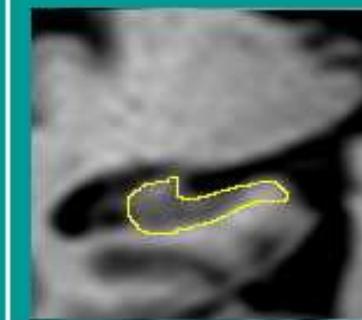
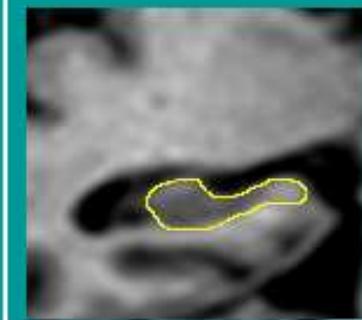
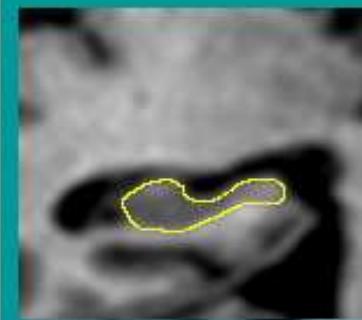
141

Anatomical
section

Native MRI



Tracing



Notes

1=Temporal horn of the lateral ventricle
2=Parahippocampal gyrus
3=Gyrus dentatus
4=Subiculum
5=Pulvinar

2B) AD

142

143

144

145

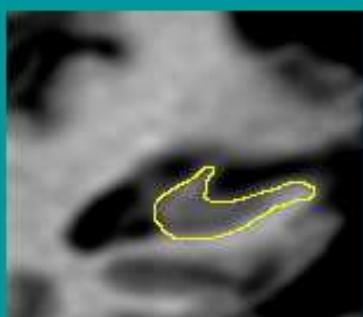
146

Anatomical
section

Native MRI

Tracing

Notes



Most posterior slice: slice before
the full appearance of the fornix



Sagittal
view

2B) AD

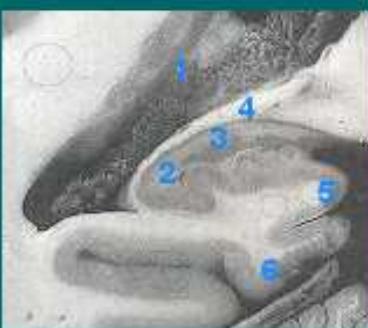
148

149

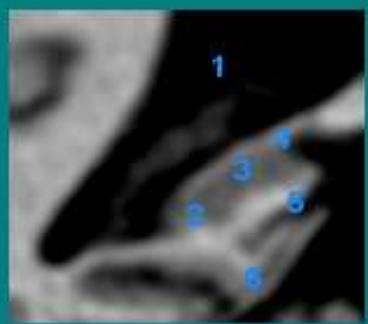
150

151

152

Anatomical
section

Native MRI



Tracing

Notes

- 1=Temporal horn of the lateral ventricle
- 2=Cornu Ammonis
- 3=Gyrus dentatus
- 4=Fornix
- 5=Isthmus
- 6=Parahippocampal gyrus