

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

AUTHOR-CERTIFIED PROTOCOL FEATURES AND TRACINGS

Bartzokis G, Altshuler LL, Greider T, Curran J, Keen B, Dixon WJ. *Reliability of medial temporal lobe volume measurements using reformatted 3D images.*

Psychiatry Res. 1998; 82:11-24

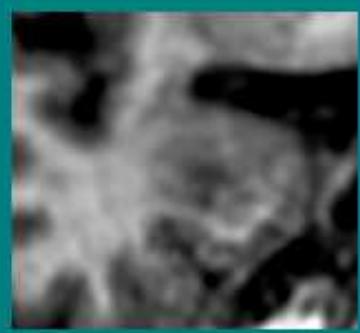
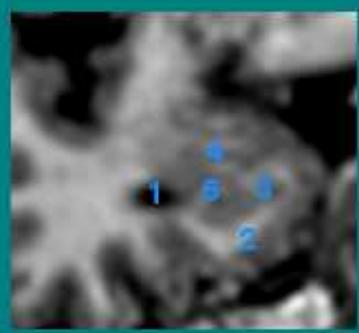
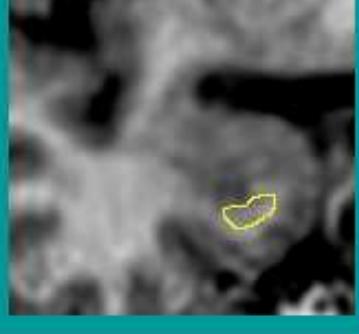
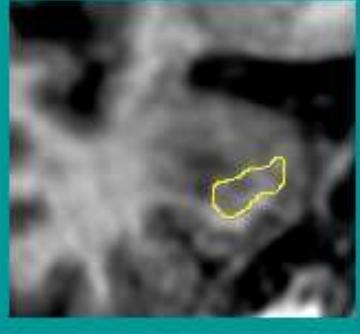
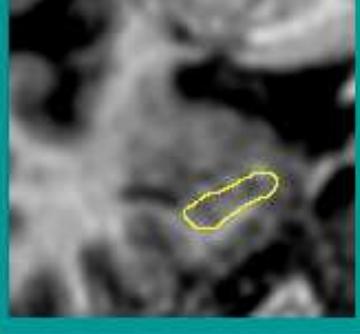
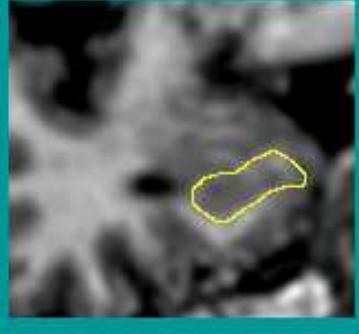
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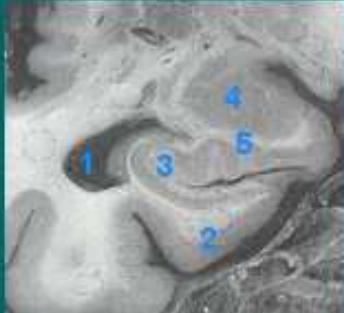
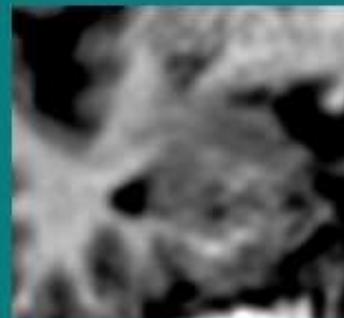
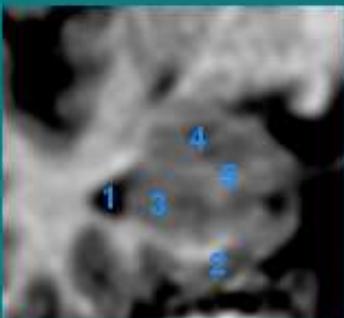
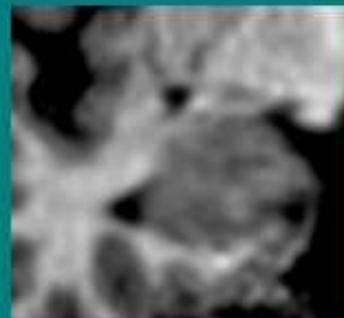
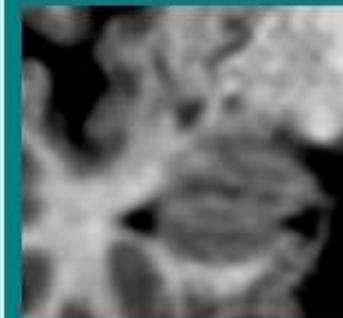
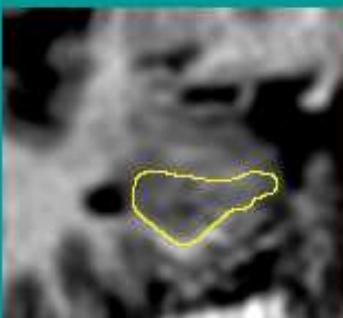
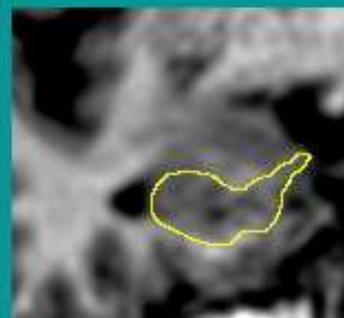
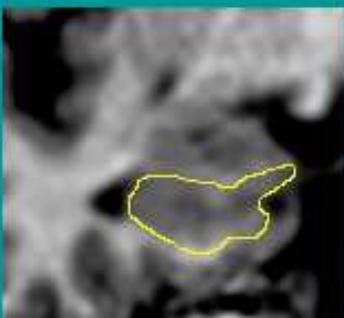
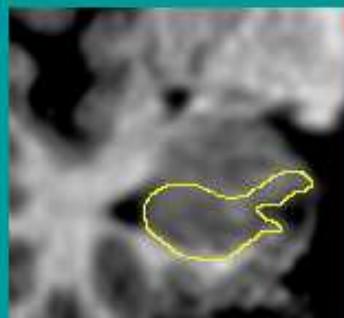
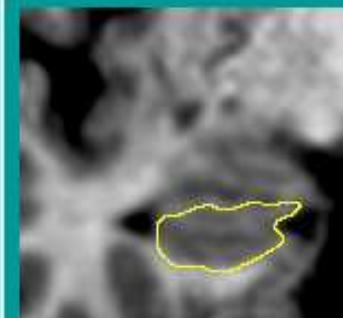
- 1) An excerpt of the Survey of anatomical landmarks according to Bartzokis et al.'s criteria.
- 2)The hippocampal tracing on consecutive coronal slices of a 1.5T ADNI control subject (**2A**) and AD patient (**2B**).

1. Excerpt of the General Survey Table with anatomical landmarks according to Bartzokis et al.'s criteria.

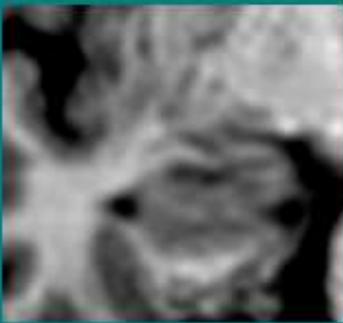
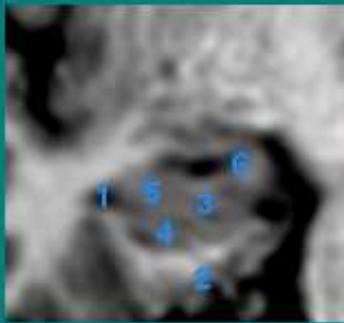
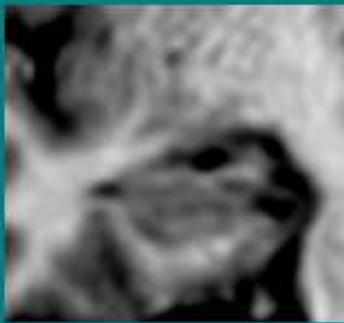
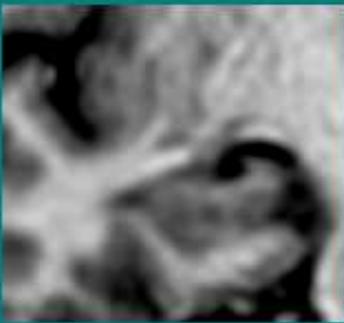
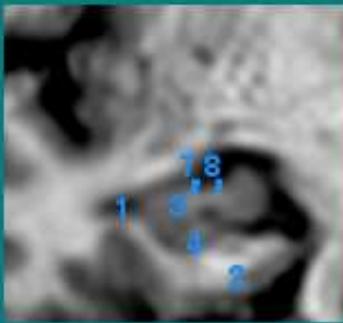
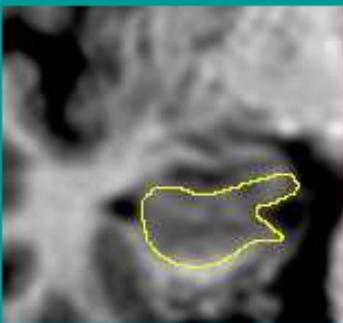
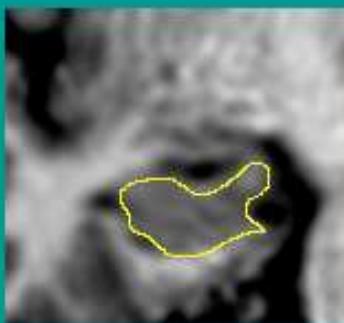
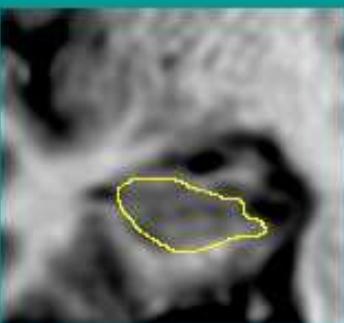
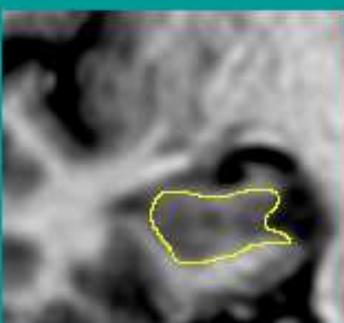
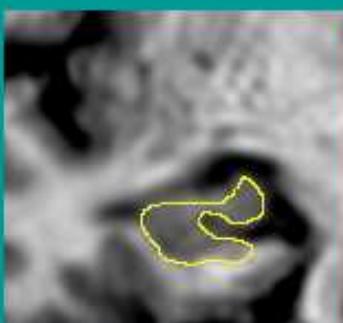
Plane				
axis of the left hippocampus				
Start tracing				
from head to tail				
Areas explicitly included		Areas explicitly excluded	Most anterior slice	Most posterior slice
subiculum		entorinal cortex and parahippocampal gyrus, fimbria and alveus	level at which the alveus appears and distinguishes the amygdala from hippocampus. If alveus is not visible temporal horn of the lateral ventricle (Bartzokis 1993)	first slice where the inferior and superior colliculi are jointly visualized (anterior to posterior)
BOUNDARIES				
HEAD	Lateral border	Inferior border	Medial border	Superior border
HEAD	adjacent WM of temporal stem	white matter of the parahippocampal gyrus	the subiculum has to be cut off from the cortex of the parahippocampal gyrus through a horizontal line	temporal horn of the lateral ventricle/alveus
BODY	adjacent WM of temporal stem	white matter of the parahippocampal gyrus	the subiculum has to be cut off from the cortex of the parahippocampal gyrus through a horizontal line	temporal horn of the lateral ventricle/fimbria
TAIL	crus of fornix	white matter of the parahippocampal gyrus	the subiculum has to be cut off from the cortex of the parahippocampal gyrus through a horizontal line	atrium of lateral ventricle/alveus

2A)CTRL

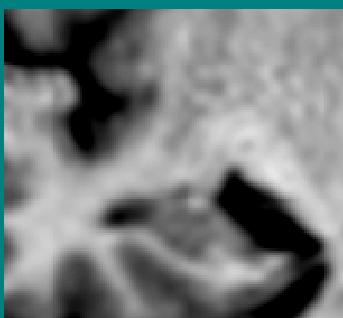
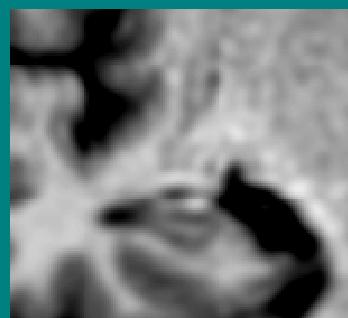
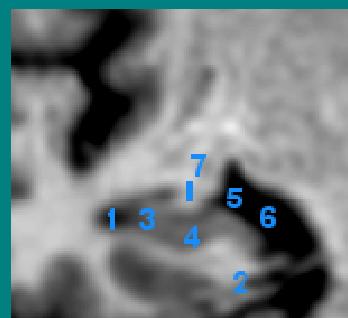
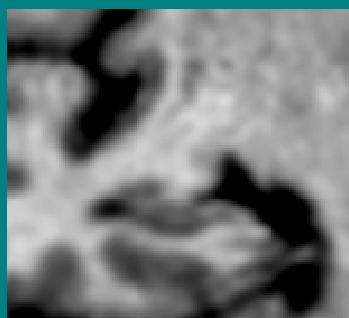
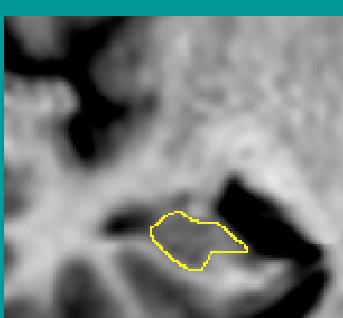
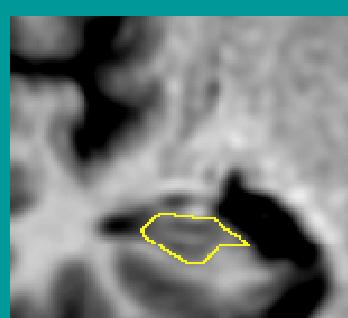
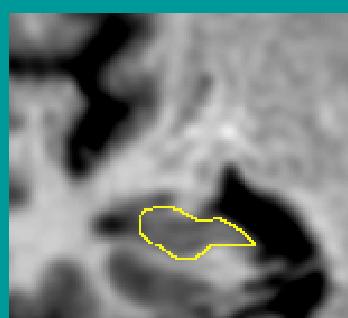
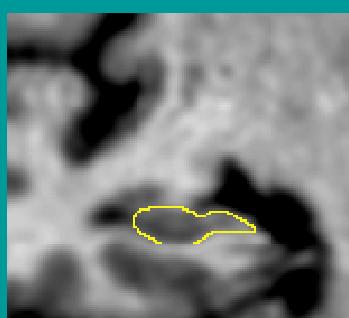
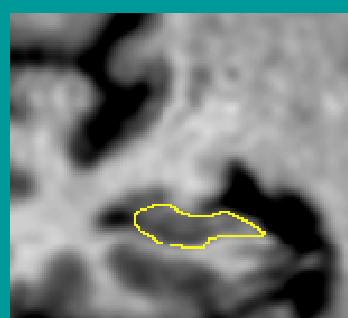
	118	119	120	121	122
Anatomical section					
Native MRI					
Tracing					
Notes		<p>Most anterior slice: level at which the alveus distinguishes the amygdala from hippocampus</p>  <p>Sagittal view</p>			<p>1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Hippocampal head 4=Amygdala 5=Alveus</p>

2A)CTRL	123	124	125	126	127
Anatomical section					
Native MRI					
Tracing					
Notes			1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Hippocampal head 4=Amygdala 5=Alveus		

2A)CTRL

	128	129	130	131	132
Anatomical section					
Native MRI					
Tracing					
Notes	1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Gyrus dentatus 4=Subiculum 5=Cornu Ammonis 6=Vertical digitation			Alveus and fimbria were excluded.	1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Gyrus dentatus 4=Subiculum 7=Alveus 8=Fimbria

2A)CTRL	133	134	135	136	137
Anatomical section					
Native MRI					
Tracing					
Notes					

2A)CTRL	138	139	140	141	142
Anatomical section					
Native MRI					
Tracing					
Notes	the subiculum has to be cut off from the cortex of the parahippocampal gyrus through a horizontal line		1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Gyrus dentatus 4=Subiculum 5=Choroidal fissure 6=Ambient cistern 7=Fimbria 8=Lateral geniculate body		

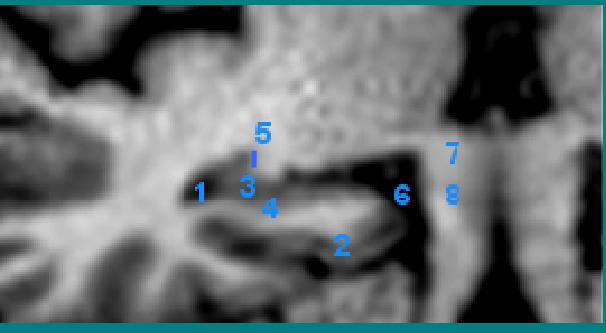
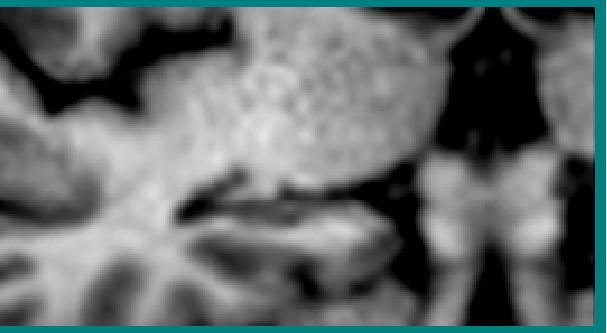
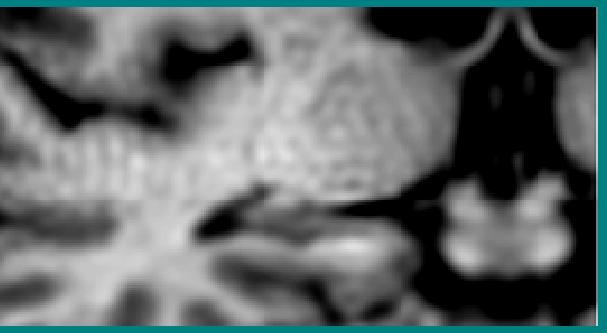
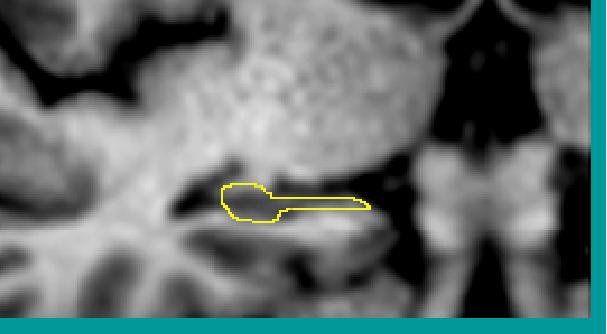
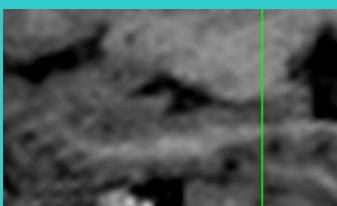
2A)CTRL	143	144	145	146
Anatomical section				
Native MRI				
Tracing				
Notes				

2A)CTRL

147

148

149

Anatomical section			
Native MRI			
Tracing			
Notes	<p>1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Gyrus dentatus 4=Subiculum 5=Fimbria 6=Ambient cistern 7=superior colliculus 8=inferior colliculus</p>	<p>Most posterior slice: first slice where the inferior and superior colliculi are jointly visualized (anterior to posterior)</p>  <p>Sagittal,view</p>	

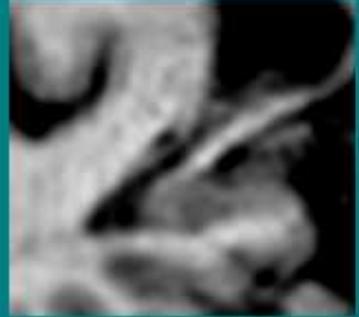
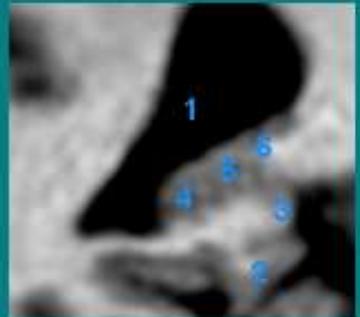
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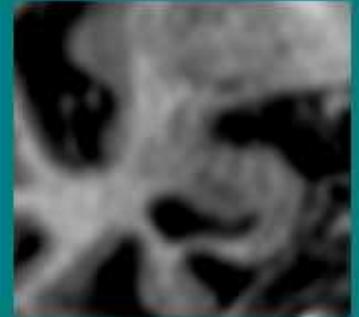
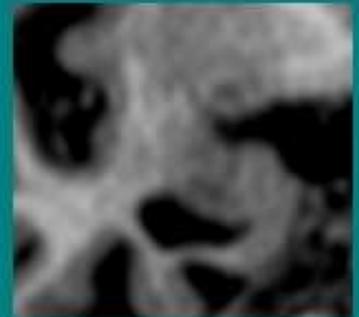
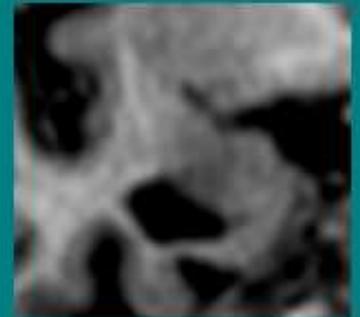
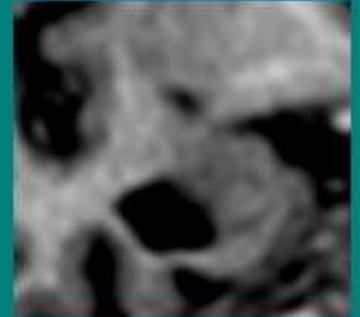
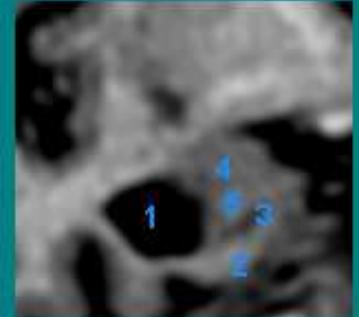
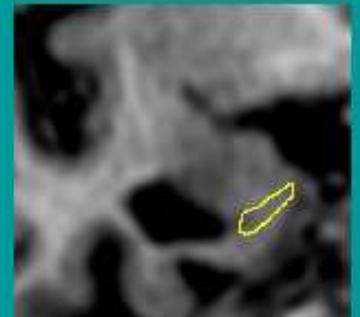
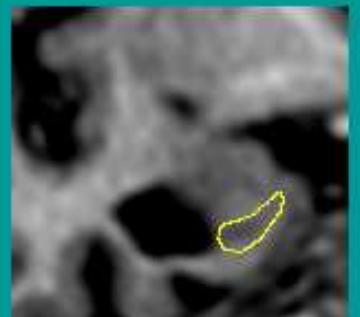
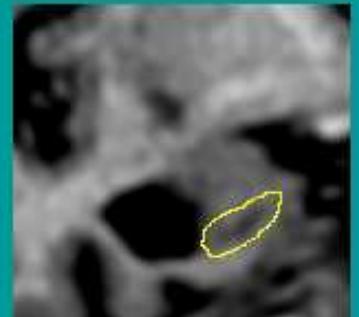
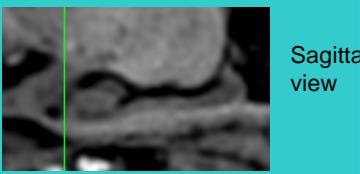
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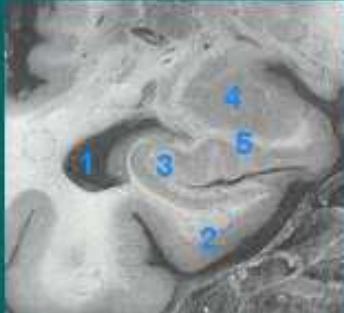
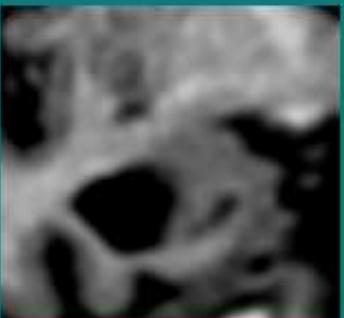
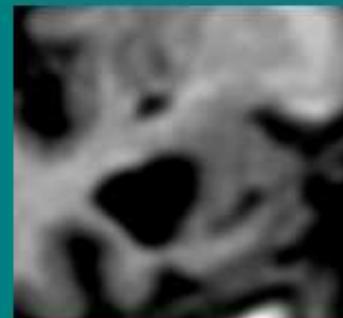
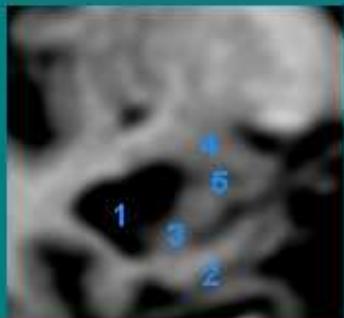
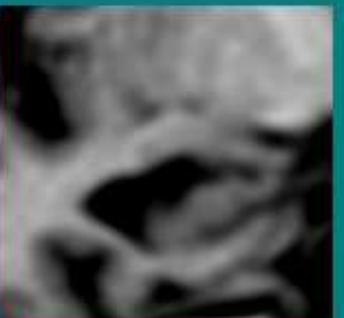
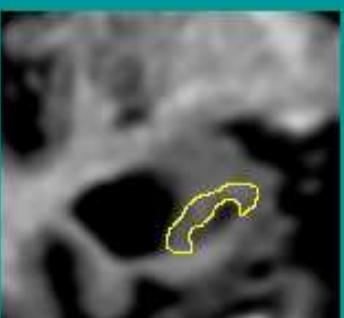
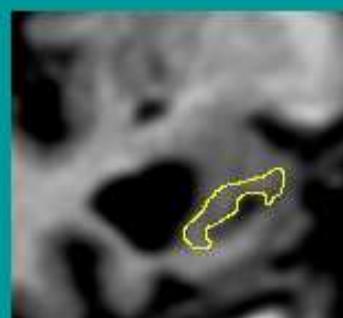
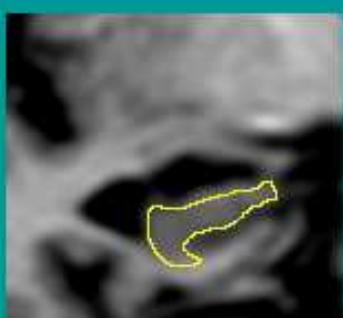
Anatomical section			
Native MRI			
Tracing			
Notes			

2A)CTRL	153	154	155	156	157
Anatomical section					
Native MRI					
Tracing					
Notes				<p>1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Isthmus 4=Cornu Ammonis 5=Gyrus dentatus 6=Crus of fornix</p>	

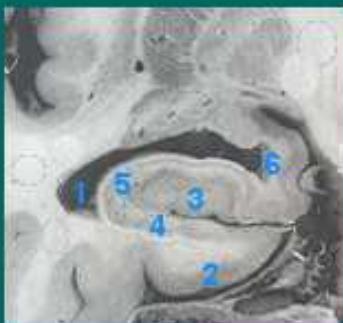
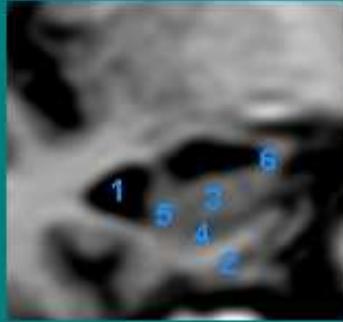
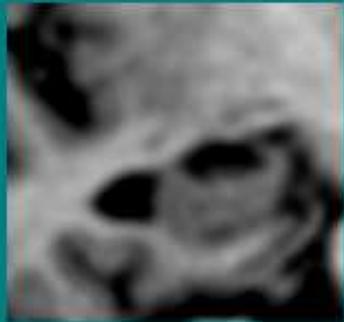
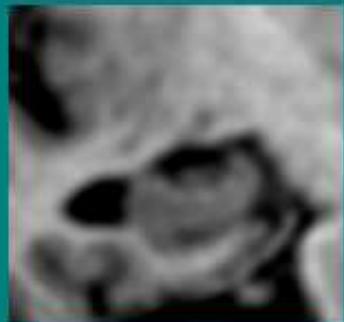
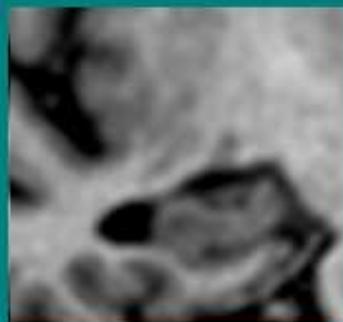
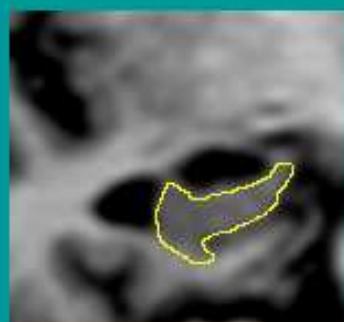
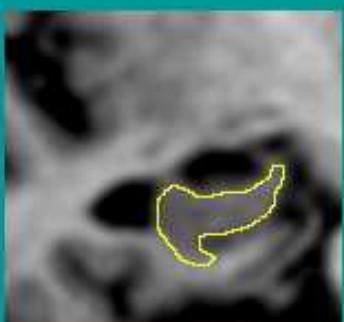
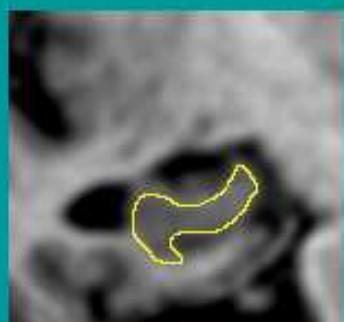
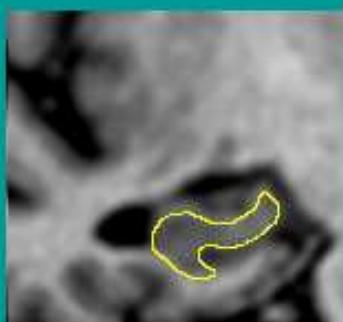
2B) AD

	114	115	116	117	118
Anatomical section					
Native MRI					
Tracing					
Notes			<p><u>Most anterior slice:</u> level at which the alveus distinguishes the amygdala from hippocampus</p>  <p>Sagittal view</p>		<p>1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Hippocampal head 4=Amygdala 5=Alveus</p>

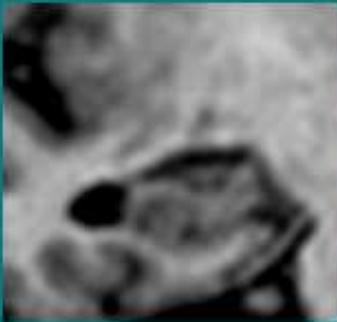
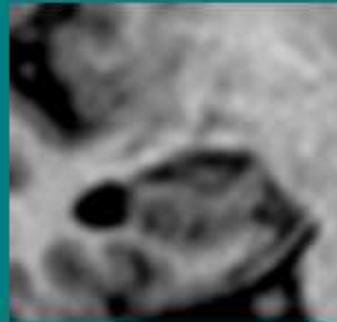
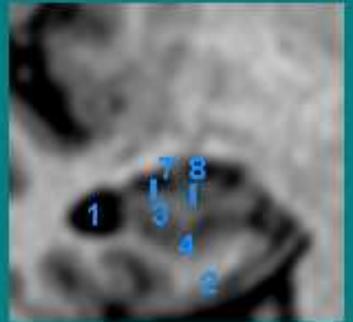
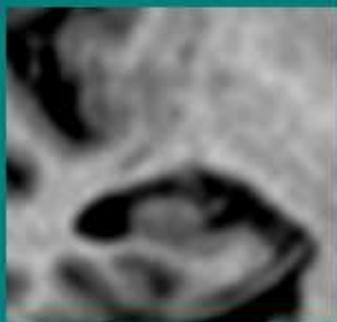
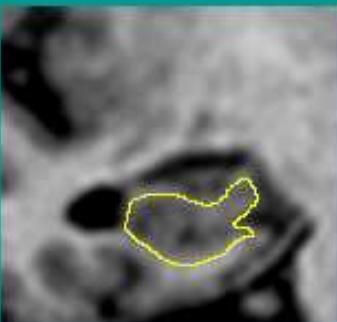
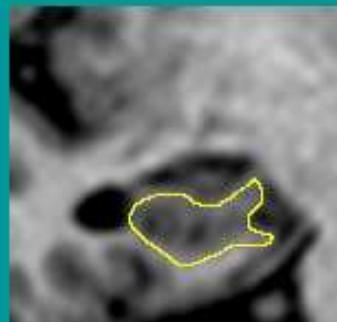
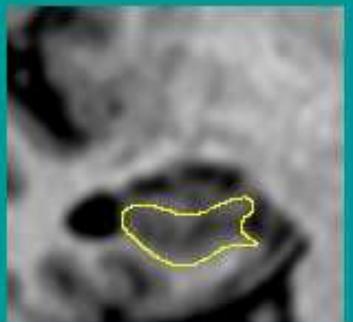
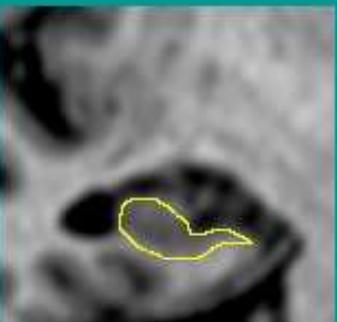
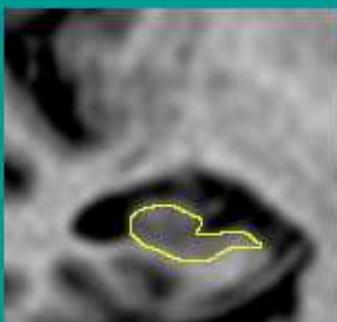
2B) AD

	119	120	121	122	123
Anatomical section					
Native MRI					
Tracing					
Notes			<p>1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Hippocampal head 4=Amygdala 5=Alveus</p>		

2B) AD

	124	125	126	127	128
Anatomical section					
Native MRI					
Tracing					
Notes	1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Gyrus dentatus 4=Subiculum 5=Cornu Ammonis 6=Vertical digitation				

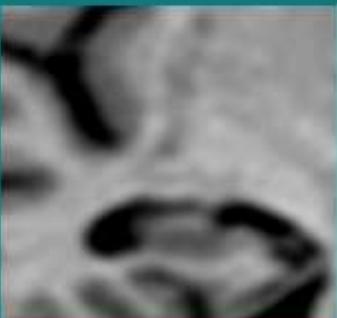
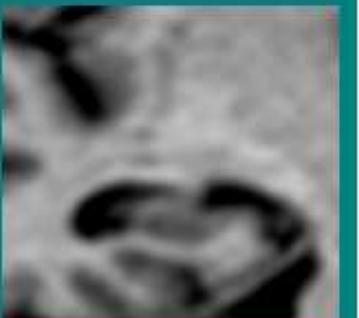
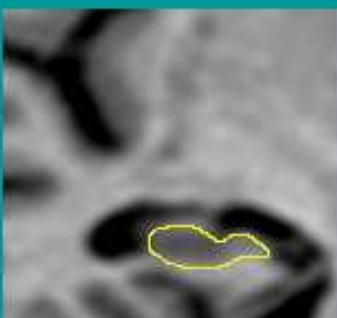
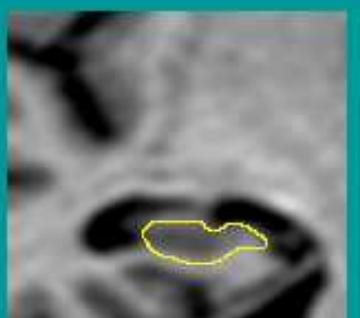
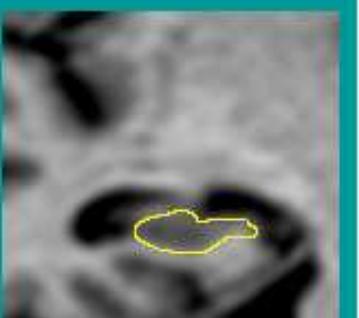
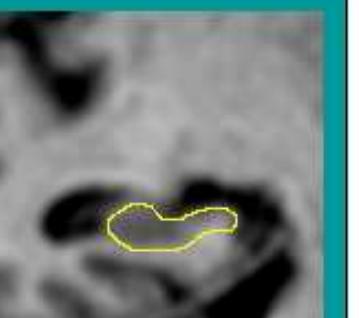
2B) AD

	129	130	131	132	133
Anatomical section					
Native MRI					
Tracing					
Notes			<p>1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Gyrus dentatus 4=Subiculum 7=Alveus 8=Fimbria</p>		

2B) AD

	134	135	136	137	138
Anatomical section					
Native MRI					
Tracing					
Notes					

2B) AD

	139	140	141	142	143
Anatomical section					
Native MRI					
Tracing					
Notes		1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Gyrus dentatus 4=Subiculum 5=Choroidal fissure 6=Ambient cistern 7=Fimbria			

2B) AD

	144	145	146	147	148
Anatomical section					
Native MRI					
Tracing					
Notes					

2B) AD

149

150

151

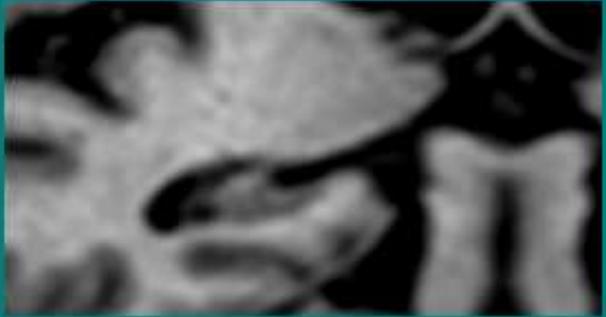
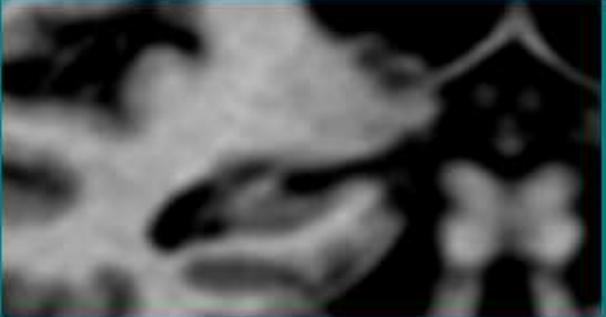
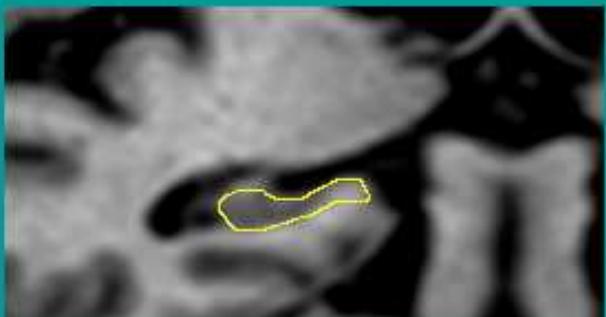
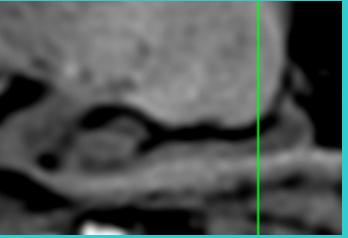
Anatomical section			
Native MRI			
Tracing			
Notes			<p>1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Gyrus dentatus 4=Subiculum 5=Fimbria 6=Ambient cistern 7=superior colliculus 8=inferior colliculus</p>

2B) AD

152

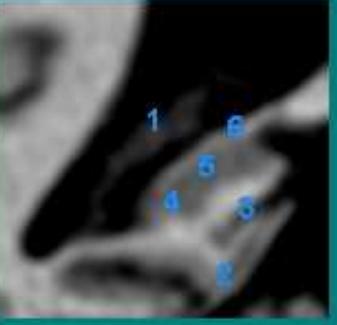
153

154

Anatomical section			
Native MRI			
Tracing			
Notes		<p><u>Most posterior slice</u>: first slice where the inferior and superior colliculi are jointly visualized (anterior to posterior)</p>  <p>Sagittal view</p>	

2B) AD	155	156	157	158	159
Anatomical section					
Native MRI					
Tracing					
Notes					

2B) AD

	160	161	162	163	164
Anatomical section					
Native MRI					
Tracing					
Notes	1=Temporal horn of the lateral ventricle (uncal recess) 2=Parahippocampal gyrus 3=Isthmus 4=Cornu Ammonis 5=Gyrus dentatus 6=Crus of fornix				