

## Comparative Neuroanatomy of Mammals, Birds, Turtles and Lizards and Crocodiles

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Mammal	Bird	Turtle and Lizard	Crocodile
<p><b>Prefrontal neocortex</b></p> <p>The avian nidopallium is either considered homologous to layers II and III cells of the mammalian cortex, or to part of the claustrum.</p>	<p>Nidopallium caudolaterale (analogous but not homologous)</p> <p>Cell types intermingled into anterior nidopallium</p> <p>Mesopallium, nidopallium, and primary input pallium around the anterior pathway song nuclei is the analog of the prefrontal cortex (not caudal nidopallium as Gunturken proposes).</p> <p>Cell types serrated into anterior nidopallium</p>	<p>Mesopallium does not wrap around anterior ventricle (cf birds and crocs)</p> <p>Mesopallium remains in dorsal area and extend anteriorly</p> <p>Cell types serrated into anterior nidopallium</p>	<p>Nidopallium</p> <p>Cell types intermingled into anterior nidopallium</p> <p>Mesopallium</p>
<p><b>Primary visual cortex and primary somatosensory cortex</b></p> <p>Layers of the extra striate visual cortex</p>	<p>Wulst (hyperpallium)</p> <p>The avian visual Wulst consist of several subdivisions, that some consider them homologous to different layers of the extra striate visual cortex (one that does not go through the tectum).</p> <p>Three cell populations of</p>	<p>Wulst</p> <p>DVR</p>	<p>Wulst Cell division are thin and overlapping- includes a dorsal mesopallium, intercalated hyperpallium, and hyperpallium.</p> <p>Overall structure equivalent with birds and equivalent to the thalamorecipient cells in the</p>

	the Wulst are a continuum of the DVR, including mesopallium, nidopallium-hyperpallium, and intercalated primary pallium		primary visual cortex of mammals; The DVR ( <u>dorsal ventricular ridge</u> ; primary sensory regions ( L2, Entopallium, and Basorostralis) mixed with nidopallium (cf Birds) contains a population of cells equivalent to the thalamorecipient cells in the somatosensory cortex; the <u>core nucleus of the dorsal ventricular ridge (DVR)</u> is equivalent to the entopallium of birds and the extrastriate cortex layer IV cells of mammals
<b>Associative cortex</b>  Could be considered similar to Layer III but in higher association areas, or it could be considered a mixture of layer III and layer IV of mammalian cortex.	Mesopallium (associative cortex and mesopallium may be at least partly homologous, but this is not well sorted out)  The Mesopallium is enigmatic, but in the avian brain represents the highest processing cell type.	Not known	Not Known
<b>Cerebrum auditory cortex</b>	Field L2, and adjacent auditory nidopallium and	Not known	Nucleus within <u>dorsal ventricular</u>

	mesopallium		<u>ridge</u>
<b>Amygdala</b>  Mammalian cortex layer V and parts of the amygdala	Amygdaloid complex (amygdala and amygdaloid complex comparison not justified and has not been resolved)  Arcopallium – two cells types that are separated (cf crocodile)	Amygdaloid complex	Amygdaloid complex
Mammalian cortex layer IV cells or sensory input parts of the claustrum, assuming that they exist.	Entopallium, L2, Basorostralis (all 3 recently called Intercalated nidopallium), and Intercalated hyperpallium	Not known	L2
Thalamus	Thalamus	Thalamus	Thalamus
Cerebellum	Cerebellum	Cerebellum	Cerebellum
Hypothalamic-pituitary-adrenal axis (HPA)	Hypothalamic-pituitary-adrenal axis (HPA)	Hypothalamic-pituitary-adrenal axis (HPA)	Similar to that of mammals and birds
Hippocampus	Hippocampus	<u>Hippocampus</u>	<u>Medial and dorsomedial cortex</u>
Piriform cortex	Piriform cortex	Piriform cortex	Piriform cortex