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Effects of testosterone and captivity on medial and dorsal cortex volumes and neurogenesis in adult male Western Fence Lizards, *Sceloporus occidentalis*

In lizards, the medial cortex and dorsal cortex are thought to be homologous to the hippocampus in birds and mammals, in that these regions are functionally involved with spatial memory and learning. In birds and mammals, neurogenesis continues into adulthood in these regions and is associated with ability of spatial memory tasks. Little is known about whether adult neurogenesis contributes to memory formation or spatial memory in lizards. In some lizards, territory size is correlated with testosterone (T) levels. If T affects these brain regions to help with spatial navigation, manipulating T levels may influence the medial or dorsal cortex volumes and/or the incorporation of new neurons into these regions. We investigated the effects of castration and T replacement on neurogenesis in adult male *S. occidentalis*. These animals were in captivity for approximately two months. We also captured a group of adult males from the wild shortly before sacrifice to determine if captivity affects the sizes of these regions and/or neurogenesis. The density of new neurons in the medial and dorsal cortex was determined using immunohistochemistry for doublecortin (DCX), a marker of immature neurons. Numerous DCX-immunoreactive cells were found in the medial cortex, however, there were few to no DCX-immunoreactive cells found in the dorsal cortex. Captivity has negative effects on medial cortex volume and possibly neurogenesis within this region. The functional significance of the presence new neurons in the medial cortex of lizards remains to be determined. However if captivity does decrease neurogenesis, determining the effects of other variables on neurogenesis in captive animals may be difficult to determine.