

# IMPACT OF CHRONIC STRESS ON HIPPOCAMPAL MICROGLIA AND NEUROGENESIS: IMPLICATIONS OF THE LPA-LPA1 PATHWAY MODULATION IN MICE.

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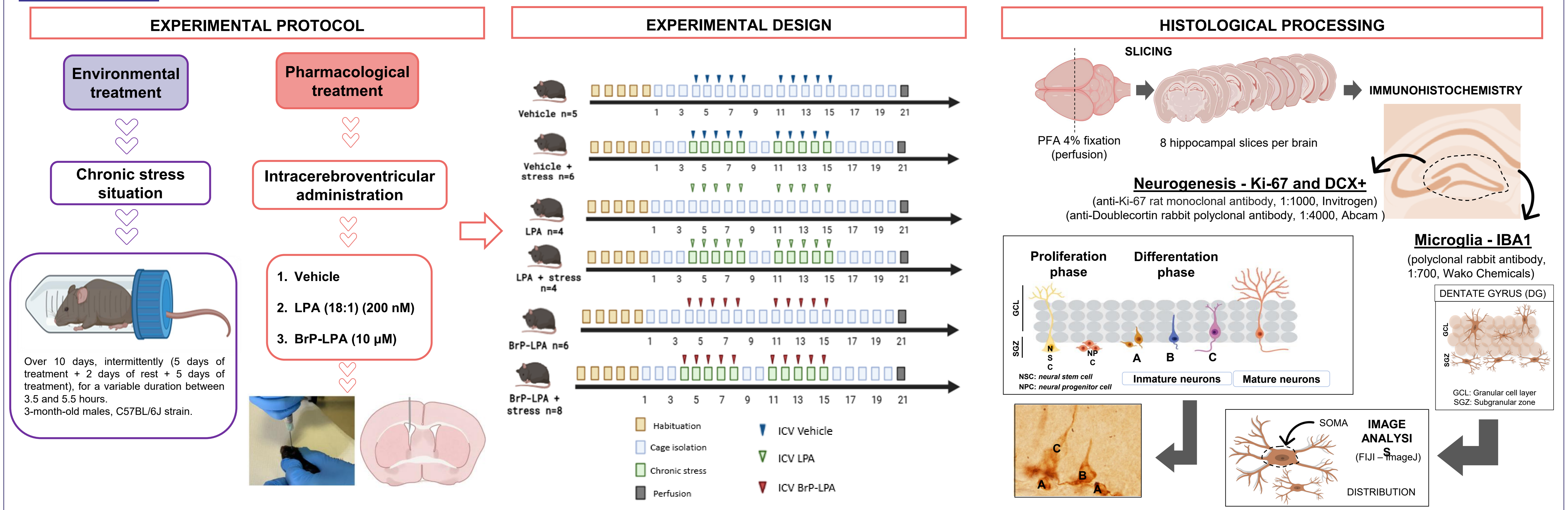
## BACKGROUND

Chronic stress is a major environmental risk factor for depression, significantly impacting mental health. It disrupts hippocampal functions, essential for memory and emotional regulation, by impairing neurogenesis and inducing neuroinflammation, potentially leading to depressive symptoms. Recent evidence highlights the critical role of microglial cells and the lysophosphatidic acid (LPA) signaling pathway, particularly the LPA1 receptor, in these processes.

## MAIN OBJECTIVE

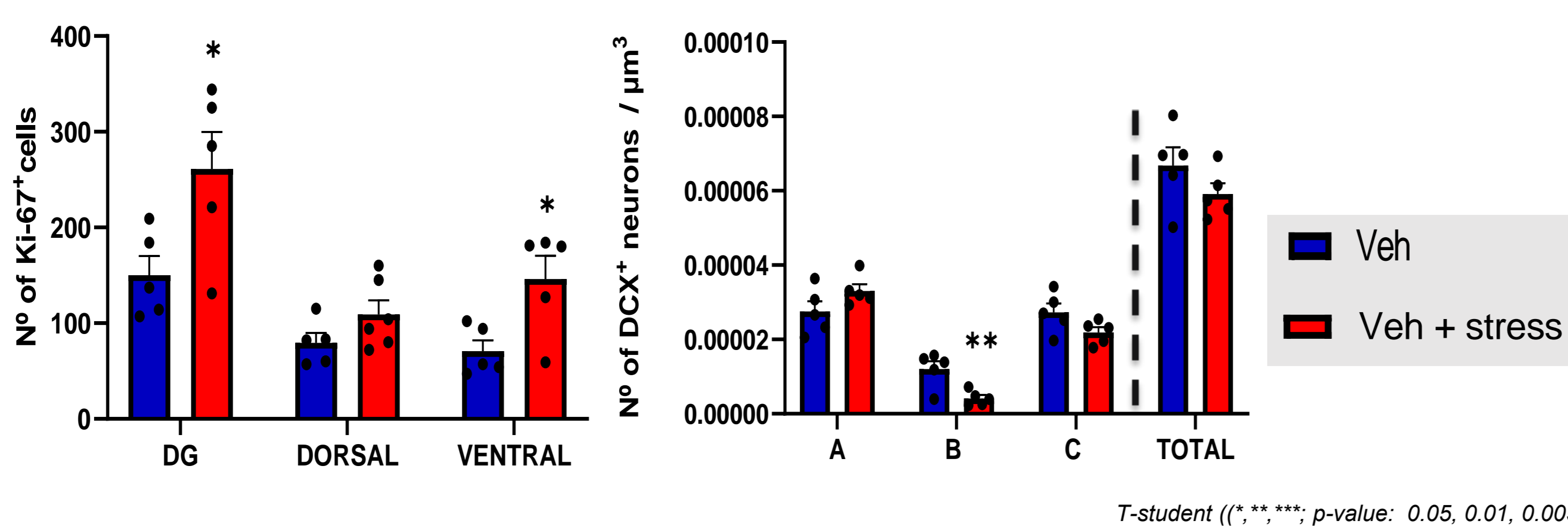
To investigate the effects of chronic unpredictable stress on microglial activity and neurogenesis in the hippocampal dentate gyrus of mice, focusing on the LPA-LPA1 signaling system.

## METHODS

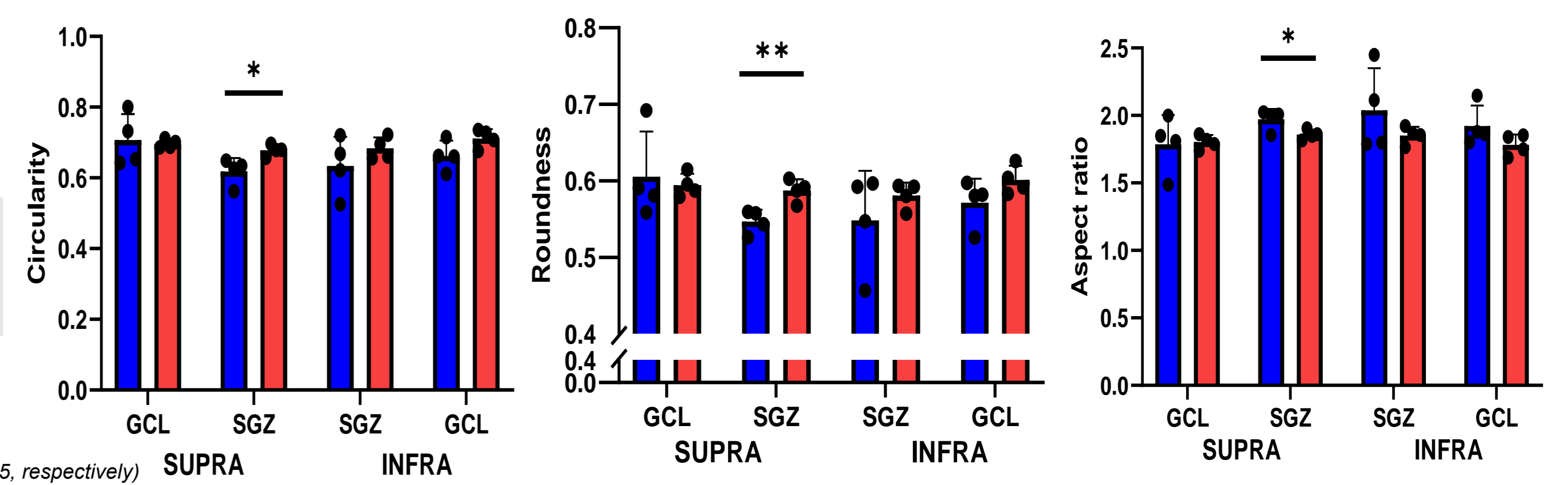


## RESULTS

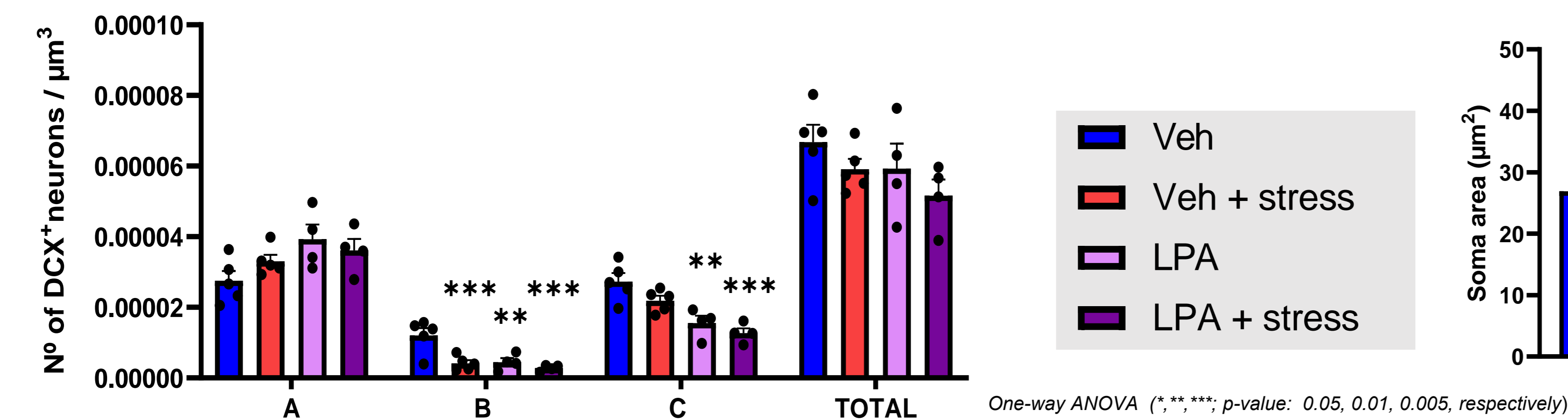
1. Chronic stress increases cell proliferation in the dentate gyrus but delays neuronal maturation, with type A neurons predominating.



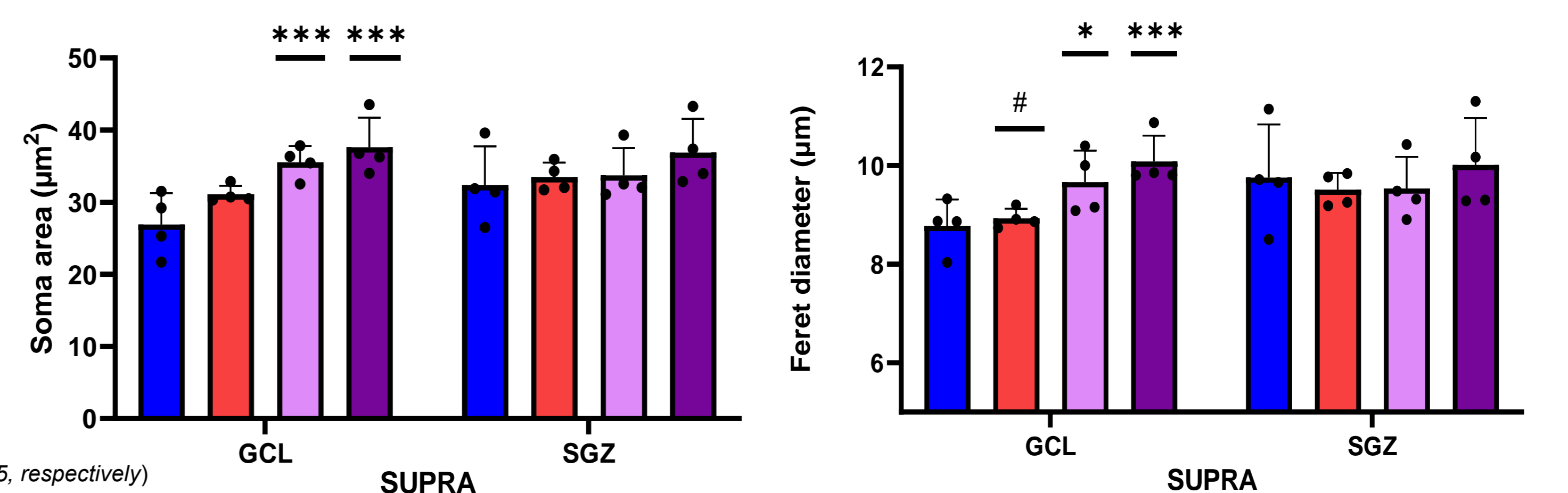
2. Stress alters microglial soma morphology, increasing circularity and roundness, indicative of a reactive state.



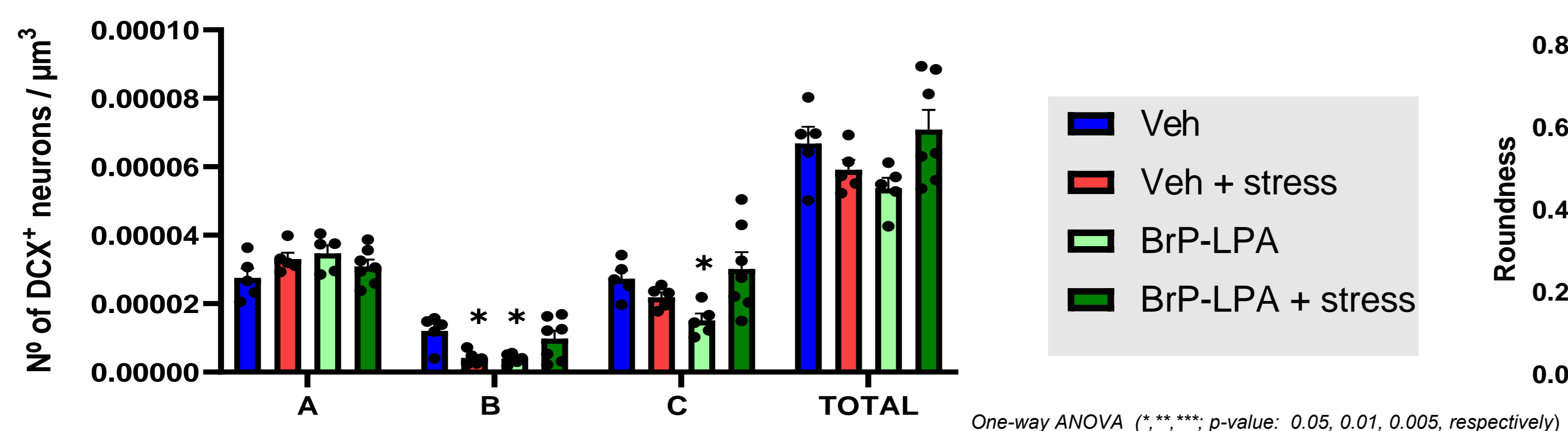
3. LPA administration reduces the density of type B and C cells, impairing neurogenesis.



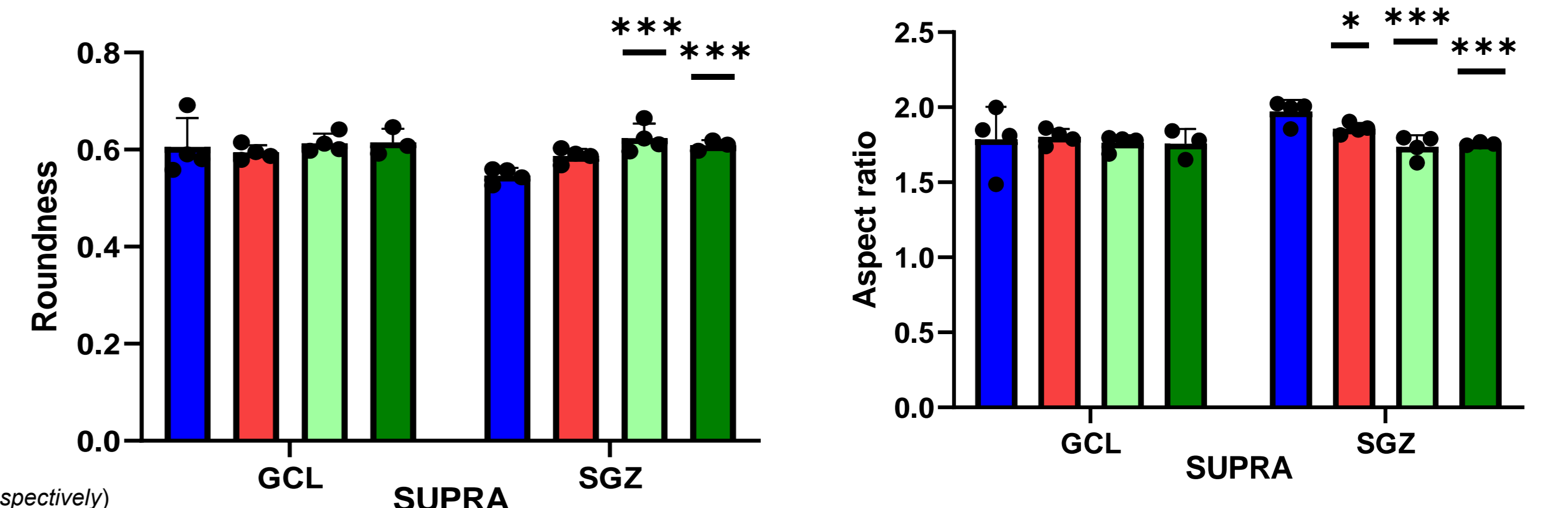
4. LPA does not prevent stress-induced changes but independently modifies neuronal morphology, increasing area and Feret diameter.



5. Blocking the LPA pathway delays neuronal maturation; however, this effect is absent under stress conditions.



6. Microglia in the dentate gyrus show morphological changes and altered distribution in response to LPA pathway inhibition, with the SGZ being most affected.



## CONCLUSION

Chronic stress disrupts neurogenesis and microglial function in the hippocampus, altering cell proliferation, neuronal maturation, and microglial morphology. The LPA system modulates these responses, playing a key role in neuroplasticity. Although LPA does not prevent stress-induced changes, it independently affects neuronal maturation, emphasizing its importance in the brain's stress response mechanisms.

## ACKNOWLEDGEMENTS



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