

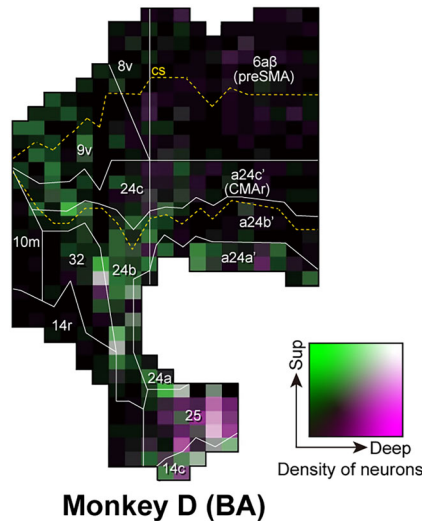
This Week in The Journal

How Mitochondria Influence Neural Homeostatic Mechanisms

Dobromila Pekala, Maurice Safar, Madeline Lampert, Duc Duong, Stephanie A. Zlatic et al.

(see article [e0515262026](#))

When environmental or bodily signals unsettle the nervous system, neurons rely on homeostatic mechanisms to return to baseline levels of activity. Research suggests that neurons trigger homeostatic mechanisms by detecting perturbations to the nervous system via changes in intracellular calcium signaling. It is assumed this sensing process occurs in the cytoplasm, but Pekala and colleagues used the chick embryo spinal cord to follow up on emerging work suggesting that this process occurs in the mitochondria. The authors found evidence supporting the idea that changes in calcium levels within mitochondria may be a mechanism for sensing activity in the nervous system and triggering homeostatic mechanisms in neurons. According to the authors, identification of this mitochondrial sensor may improve understanding of neural homeostatic mechanisms.



Monkey D (BA)

Shown are mean cell counts for one of the monkeys in this study. Each 1 mm interval in which cell counts were performed is indicated with a colormap encoding superficial (sup, green) versus deep (magenta) layer densities. For both layers, high densities are in white and low densities are in black. See Kimura et al. for more information.

Mapping Anterior Cingulate Cortex to Amygdala Pathways

Kei Kimura, Yuki Soga, Rintaro Yoshino, Andi Zheng, Satoshi Nonomura et al.

(see article [e0671262026](#))

Dysfunctional interactions between the anterior cingulate cortex (ACC) and the amygdala are implicated in mood disorders. In this issue, Kimura and colleagues mapped the complex pathways between the ACC and amygdala, which were previously unclear. The authors used a vector-based neural tracing approach in macaques to assess projections from the pregenual, subgenual, and dorsal areas of the ACC to the basal and accessory basal nuclei of the amygdala. Neurons projecting from the ACC to the basal nucleus of the amygdala were found in superficial layers of all three ACC subregions. In the pregenual ACC, these neurons were more abundant in the superficial layers than in the deep layers. ACC neurons projecting to the accessory basal nucleus of the amygdala came from deep layers of the subgenual and dorsal ACC. According to the authors, this work advances understanding of the functional organization of ACC to amygdala interactions and may inform future work on their relevance to mood disorders.

This Week in The Journal was written by Paige McKeon
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