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Imaging adult cortical plasticity: moving out of the box

Developmental and adult experience-dependent plasticity have always been characterized as based on competition between sensory inputs on cortical territory. Inputs with advantage gain territory on the expense of less advantageous neighboring inputs, resulting in a bigger and stronger representation for the advantageous input. Such plasticity is typically explained by underlying Hebbian mechanisms. Surprisingly, we found that cortical plasticity induced by moving animals out of their standard home cages to a more naturalistic environment, resulted in a refined cortex characterized by smaller and weaker representations. These findings suggest alternative directions and underlying mechanisms for adult cortical plasticity beyond the standard, competition-based plasticity.