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Use of advanced microscopic and imaging techniques to "Map the Engram"

• Advances in microscopic techniques, activation-state specific markers (e.g., antibodies, FRET), and computational power can be used to map brain synapses engaged by learning.

• Wide-field deconvolution microscopy permits analysis of large areas and multiple brain regions

• Advances in understanding the cell biology of learning have identified molecular targets for analysis

The National Engram Project

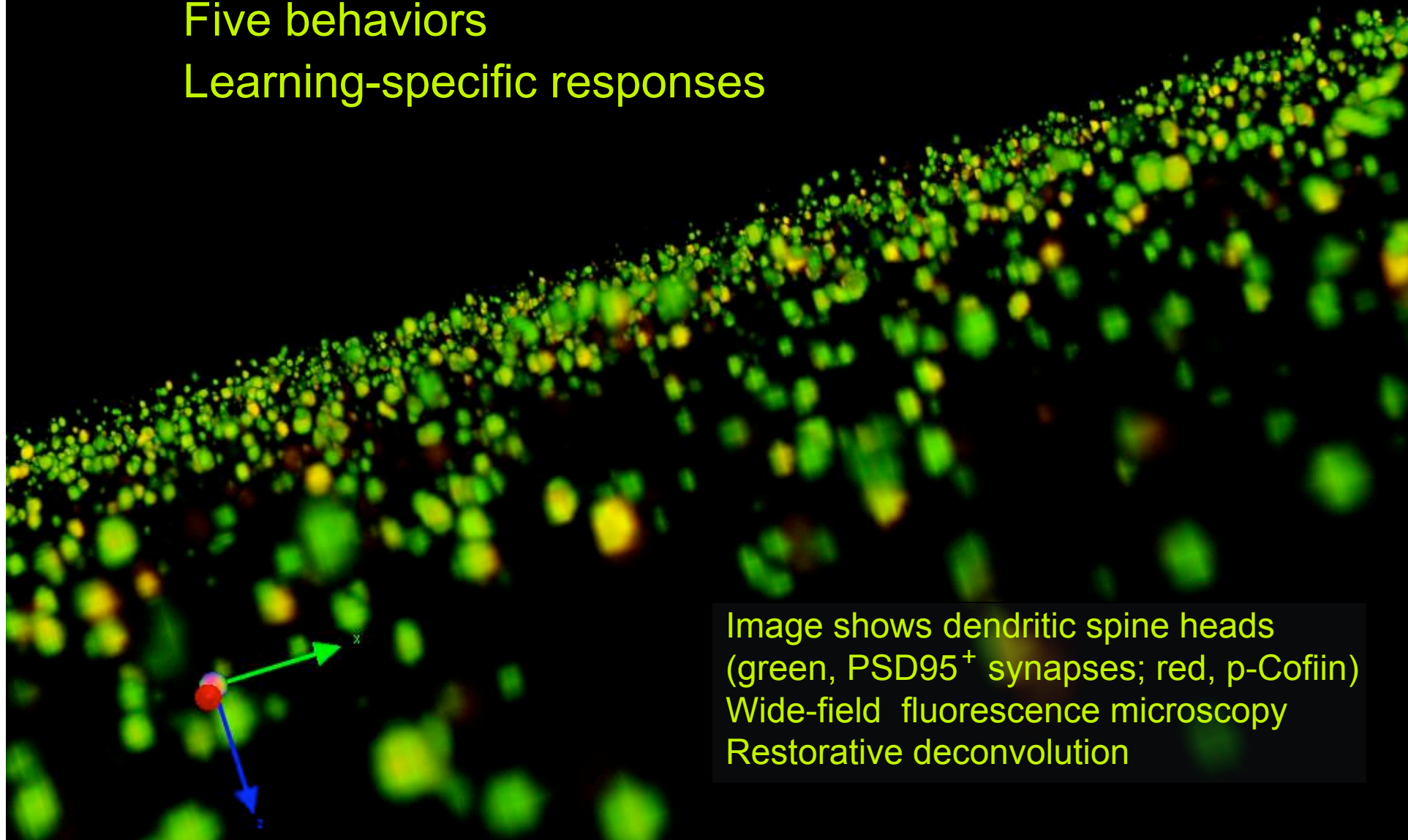Ten brain areas

Five behaviors

Learning-specific responses

Image shows dendritic spine heads
(green, PSD95$^+$ synapses; red, p-Cofiin)
Wide-field fluorescence microscopy
Restorative deconvolution