Diversity of primate brain cells unraveled

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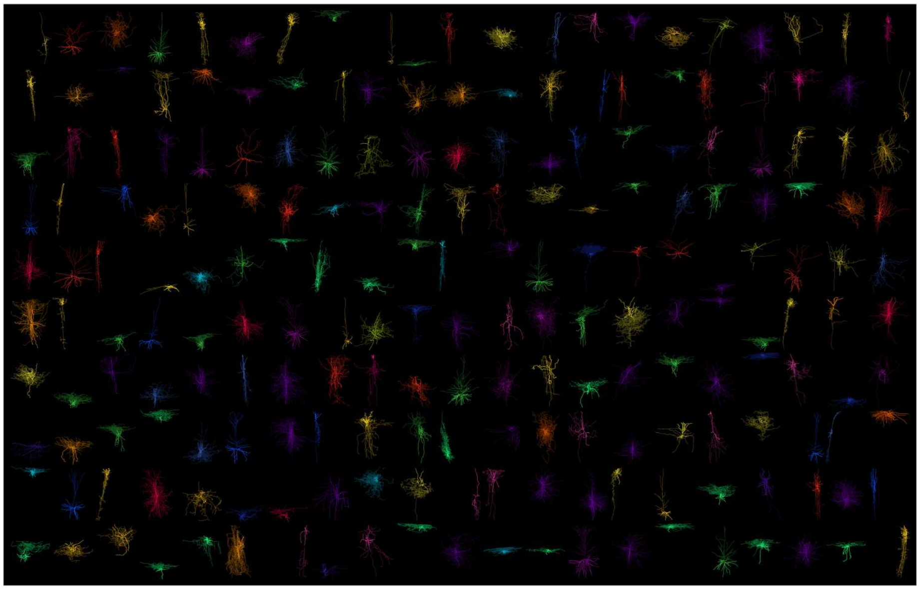

Three-dimensional renderings of reconstructed neurons analyzed in living brain slices. In experiments individual cells were stained to allow for digital reconstruction of the cell's morphology including axons and dendrites. The image shows the richness and diversity of neurons. Photo credit: Ivana Kapustová (Karolinska Institute) and Rachel Dalley, Sarah Walling-Bell and Brian Lee (Allen Institute for Brain Science).

The brain is a complex circuit of numerous cells. These brain cells are highly diverse and can be grouped into many cell types based on their molecular, electrophysiological, and morphological features. Many cell types play distinct roles in computations of brain circuits. Therefore, a comprehensive understanding of brain functions needs to consider the types of cells involved. Furthermore, brain disorders do not affect all cell types equally. The identification of the cell types primarily affected by each disorder could open the door for targeted interventions and therapeutics. Prior to these efforts, research is needed to precisely catalog the cellular diversity of the brain of the species of interest.

The current issues of *Science Advances*, *Science*, and *Science Translational Medicine* deliver a collection of studies that provide a breakthrough in our understanding of brain cell types in humans and nonhuman primates. These studies were performed through a large international consortium. The team of researchers was brought together through the National Institutes of Health's Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative Cell Census Network (BICCN), a funding mechanism launched in 2017 with the aim to develop a comprehensive description of brain cell types.

The focus on primates distinguishes the current collection of studies from previous efforts that largely concentrated on model organisms common for genetic studies. Through the application of cutting-edge single-cell profiling techniques, this *Science* family journals collection provides the first large-scale effort to characterize the fine cellular architecture of the primate brain. It begins to shed light on the cellular features that are either conserved or highly specialized in the brain of humans and nonhuman primates compared to other animals. This detail can illuminate what is unique about our brains and provide a foundation for deeper understanding of our remarkable central processor.

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