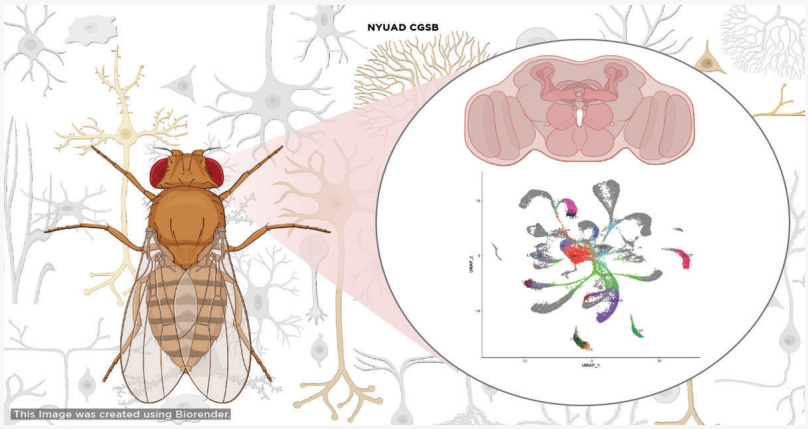
# New discoveries in fly vision open doors to a better understanding of brain function

*Building vision from stem cells: lessons from tiny brains*

ABU DHABI, ABU DHABI, UNITED ARAB EMIRATES, June 3, 2025 /EINPresswire.com/ -- Scientists have long been curious about how our brains interpret visual information and translate it into behavior. A new study led by researchers from NYU Abu Dhabi (NYUAD) and New York University (NYU) is shedding new light on this mystery, and it turns out that the answers to big questions come from studying small brains.



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Rana Naja el-Danaf- Senior Scientist

Drosophila Melanogaster, also known as fruit flies, have proven to be a powerful model for studying the development of the nervous system. Recent research, published in Nature Communications, focuses on specialized cells in the fruit fly's brain called lobula columnar neurons (LCNs), which play a crucial role in how flies see and respond to their environment, and ultimately their survival. However, where these neurons come from and how they develop are the key questions the researchers try to answer.

To find out, the scientists used single-cell mRNA sequencing, a technique that tracks gene activity in individual brain cells, and they discovered that these vision-related neurons (LCNs) don't all originate from the same place. Instead, they come from four separate brain regions, each taking a different path to become part of the visual system.

“To our knowledge, this is the first description of a class of morphologically similar neurons originating from multiple distinct progenitor regions,” researchers highlighted in the study.

While the study focuses on the fruit fly's visual system, its findings could have broader implications. This diversity in origin suggests a more flexible approach to building the brain’s visual system, one that may mimic processes in larger, more complex animals.

By studying the small brain of fruit flies, researchers are exploring universal principles of how neural circuits are built.

Senior Scientist Rana Eldanaf notes that: “This finding is particularly noteworthy, as it presents the first indication that a set of functionally similar neurons can emerge from multiple distinct stem cell sources.

Such a pattern suggests an evolutionary adaptation in which separate brain regions independently give rise to parallel visual pathways—potentially optimizing Drosophila’s ability to interpret its environment.

In addition to its implications for developmental neuroscience, this discovery offers potential insights into the origins of neurodevelopmental disorders, which can result from errors in neuronal formation. Many neurodegenerative conditions involve the targeted loss of specific neuron types, uncovering how various stem cells contribute to neuronal diversity could inform strategies for future regenerative therapies.”

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