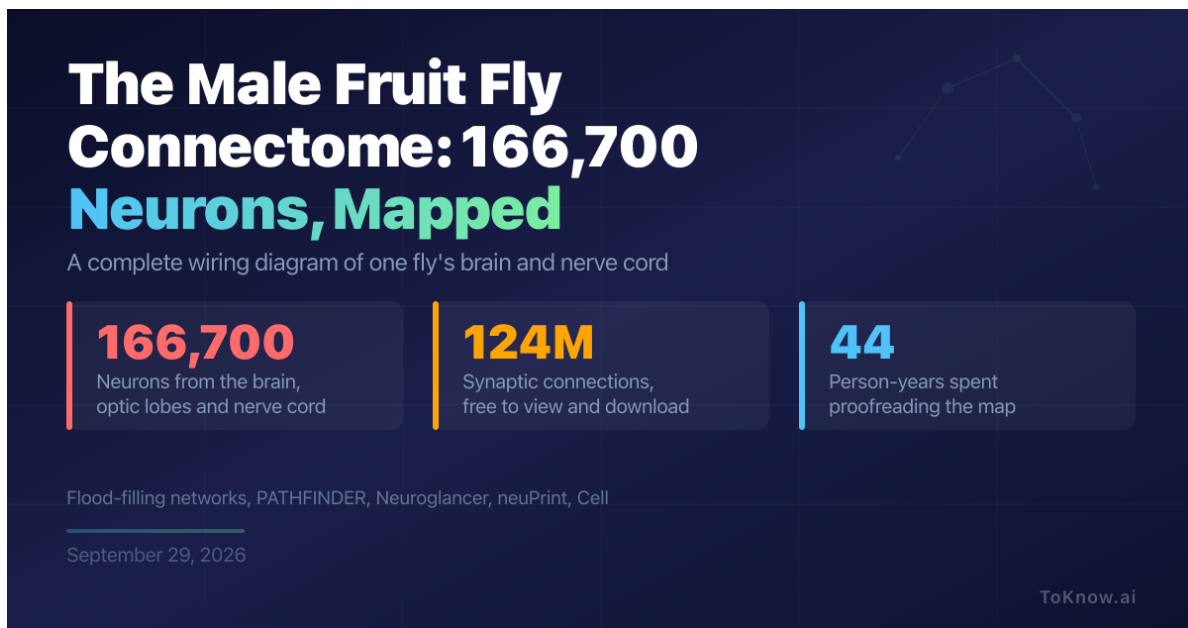


The Male Fruit Fly Connectome: 166,700 Neurons, and Where the Sexes Differ

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Researchers at HHMI Janelia, with Google Research, the MRC Laboratory of Molecular Biology and the University of Cambridge, have published a complete wiring diagram of a male fruit fly's central nervous system. A connectome maps which neurons connect to which, and how strongly. This one covers the brain, the optic lobes and the ventral nerve cord, the insect

equivalent of a spinal cord, tracing 166,700 neurons joined by about 124 million synaptic connections. Published in [Cell](#) on September 3, it is the first complete map of a male fly, and the data is free to download.

Comparing it with the previously mapped female nervous system shows how little separates the sexes. Across the central brain, 8,069 cell types are equivalent, 138 are the same cell wired differently in each sex, 289 appear only in males and 71 only in females. Those differences sit almost entirely in the brain's higher-order centres, while the sensory and motor periphery is largely the same; the neurons that do differ reroute information rather than adding new parts. Three companion papers published the same day already use the map to study vision, taste and social behaviour.

Google's flood-filling networks turned electron microscope images into a graph automatically, but checking the result still fell to people: 29 expert proofreaders spent three years, an estimated 44 person-years, correcting it. The team's fix is training its reconstruction system on synthetic neurons to cut that load. Vertebrate maps, including a larval zebrafish brain, are next.

Read More: [Living Human Neurons Play Doom](#) covers the other half of the brains-are-computers story, where neurons are wired up to a chip instead of mapped.

Sources:

- [A connectomics milestone: Mapping the complete male fruit fly brain](#)
- [Sexual dimorphism in the complete Drosophila male central nervous system connectome \(Cell\)](#)
- [FlyEM Male CNS Connectome project page](#)
- [Download the male CNS connectome dataset](#)
- [Drosophila Male Fly Connectome collection \(Cell Press\)](#)

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