Dopamine degeneration and neuroinflammation in *Drosophila melanogaster*

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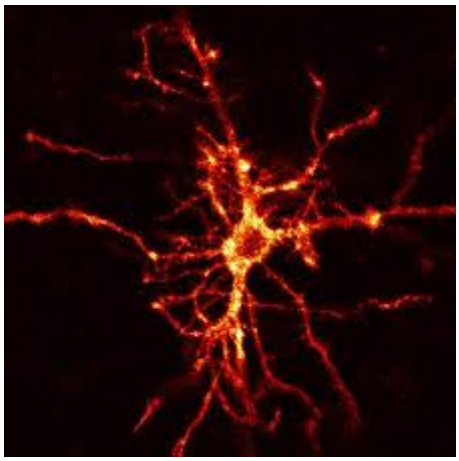

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Neuroinflammation is a complex innate immune response vital to the healthy function of the central nervous system (CNS). Under normal conditions, this intricate network of inducers, detectors and activators rapidly responds to neuron damage, infection or other immune infractions. This inflammation of immune cells is intimately associated with the pathology of neurodegenerative disorders, such as Parkinson's disease, Alzheimer's disease and ALS. In this compromised state, however, a persistent, chronic inflammation often occurs and, while intended to minimize neuron damage, may lead to an over-excitation of the immune cells and ultimately exacerbate the progression of the disease. Loss of dopamine neurons in the midbrain, a hallmark of Parkinson's disease, is accelerated by the excessive activation of the inflammatory response. Here, we use the conserved innate immune response in *Drosophila melanogaster* to investigate genetic components associated with dopamine regulation and neuroinflammation. Through chemical and genetic induction of Parkinsonian-like symptoms and neuron damage, we assess the impact of specific genes on dopamine production, dopamine turnover and, through use of a novel and recently-developed quantitative assay, the stimulation of NO, a cell-signaling molecule critical to the activation of the inflammatory response cascade and death of target neurons.