

What process causes nigral cell death in Parkinson's disease?

[Jenner P.](#)

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Parkinson's Disease Society Experimental Research Laboratories, King's College
London, United Kingdom.

The action of toxins or the altered metabolism of dopamine may lead to oxidative stress in substantia nigra, thereby inducing dopamine cell death and the onset of Parkinson's disease. Postmortem studies showing a depletion of reduced glutathione and increased mitochondrial superoxide dismutase activity suggest the occurrence of an ongoing toxic process in substantia nigra involving free radical mechanisms. Indeed there is a selective impairment of complex I of the mitochondrial respiratory chain in substantia nigra in Parkinson's disease, mimicking the mode of action of the selective nigral toxin MPTP. The increased formation of free radical species in substantia nigra in patients with Parkinson's disease may be accelerated by an accumulation of iron within this brain region. Altered iron metabolism and impaired mitochondrial function are not apparent in the early stages of the illness and therefore may act as accelerators of some other primary pathologic process.

