Aminochrome as a preclinical experimental model to study degeneration of dopaminergic neurons in Parkinson's disease

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Four decades after L-dopa introduction to PD therapy, the cause of Parkinson's disease (PD) remains unknown despite the intensive research and the discovery of a number of gene mutations and delections in the pathogenesis of familial PD. Different model neurotoxins have been used as preclinical experimental models to study the neurodegenerative process in PD, such as 6-hydroxydopamine (6-OHDA), 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP), and rotenone. The lack of success in identifying the molecular mechanism for the degenerative process in PD opens the question whether the current preclinical experimental models are suitable to understand the degeneration of neuromelanin-containing dopaminergic neurons in PD. We propose aminochrome as a model neurotoxin to study the neurodegenerative processes occurring in neuromelanin-containing dopaminergic neurons in PD. Aminochrome is an endogenous compound formed during dopamine oxidation and it is the precursor of neuromelanin, a substa