One-electron reduction of 6-hydroxydopamine quinone is essential in 6-hydroxydopamine neurotoxicity

Villa, Monica

Muñoz, Patricia

Ahumada-Castro, Ulises

Paris, Irmgard

Jiménez, Ana

Martínez, Isabel

Sevilla, Francisca

Segura-Aguilar, Juan

6-Hydroxydamine has widely been used as neurotoxin in preclinical studies related on the neurodegenerative process of dopaminergic neurons in Parkinson's disease based on its ability to be neurotoxic as a consequence of free radical formation during its auto-oxidation to topaminequinone. We report that 50-?M 6-hydroxydopamine is not neurotoxic in RCSN-3 cells derived from substantia nigra incubated during 24 h contrasting with a significant sixfold increase in cell death (16 ± 2 %; P < 0.001) was observed in RCSN-3NQ7 cells expressing a siRNA against DT-diaphorase that silence the enzyme expression. To observe a significant cell death in RCSN-3 cells induced by 6-hydroxydopamine (24 ± 1 %; P < 0.01), we have to increase the concentration to 250 ?m while a 45 ± 2 % cell death (P < 0.001) was observed at this concentration in RCSN-3NQ7 cells. The cell death induced by 6-hydroxydopamine in RCSN-3NQ7 cells was accompanied with a (i) significant increase in oxygen consumption (P < 0.01), (i