

Identification of neuron-derived protecting factors against oxidative stress

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The protection of neurons from cell death is a vulnerable strategy to prevent neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease, since neuronal cell death is one of the major events in pathology of these diseases. PC12D cells are subspecies of PC12 cells which have been used for a variety of neuronal studies. We found that PC12D cells were resistant against 6-hydroxydopamine (6-OHDA) -induced cell death and that PC12D cell-cultured medium had abilities to decompose hydrogen peroxide (H_2O_2). The molecular weight of H_2O_2 decomposing active compounds was estimated at about 1,000 Da by gel chromatography analysis. The study using ion exchange resin column showed that the candidate compounds are not charged. The activity was not abolished by a metal ion chelater, EGTA but significantly suppressed by a polphyrin inhibitor, NaCN. These data suggest that PC12D cells secrete polphyrin-like compounds possessing H_2O_2 decomposing activities, by which cells are protected from cell death induced by 6-OHDA.