

PC12 and neuro 2a cells have different susceptibilities to acetylcholinesterase-amyloid complexes, amyloid25-35 fragment, glutamate, and hydrogen peroxide

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This work addresses the differential effects of several oxidative insults on two neuronal cell lines, PC12 and Neuro 2a cells, extensively used as neuronal models in vitro. We measured cellular damage using the cytotoxic assays for MTT reduction and LDH release and found that acetylcholinesterase (AChE)-amyloid- β -peptide ($A\beta$) complexes, $A\beta$ 25-35 fragment, glutamate and H_2O_2 were over 200-fold more toxic to PC12 than to Neuro 2a cells. 17β and 17α estradiol were able to protect both cell types from damage caused by H_2O_2 or glutamate. By contrast, other insults not related to oxidative stress, such as those caused by the nonionic detergent Triton X-100 and serum deprivation, induced a similar level of damage in both PC12 and Neuro 2a cells. Considering that the $A\beta$ peptide, H_2O_2 and glutamate are cellular insults that cause an increase in reactive oxygen species (ROS), the intracellular levels of the antioxidant compound, glutathione were verified. Neuro 2a cells were found to have 4- to 5