

# DT-Diaphorase Prevents Aminochrome-Induced Lysosome Dysfunction in SH-SY5Y Cells

Meléndez C.

Muñoz P.

Segura-Aguilar J.

Aminochrome has been reported to induce lysosomal dysfunction by inhibiting the vacuolar H-type ATPase localized in lysosome membrane. DT-diaphorase has been proposed to prevent aminochrome neurotoxicity but it is unknown whether this enzyme prevents aminochrome-induced lysosomal dysfunction. In the present study, we tested the protective role of DT-diaphorase in lysosomal dysfunction by generating a cell line (SH-SY5YsiNQ7) with a stable expression of a siRNA against DT-diaphorase with only 10% expression of mRNA enzyme. The cells differentiated with retinoic acid and 12-o-tetradecanoylphorbol-13-acetate show a significant increase in the expression of tyrosine hydroxylase, vesicular monoamine transporter-2, and dopamine transporter. The incubation of SH-SY5YsiNQ7 cells with 10  $\mu$ M aminochrome resulted in a significant decrease of lysosome pH determined by using acridine orange, while aminochrome has no effect on SH-SY5Y cells. These results support the proposed protective role of DT-diaphorase against aminochrome-induced lysosomal dysfunction. © 2018, Springer Science+Business Media, LLC, part of Springer Nature.

Aminochrome

Dopamine

DT-Diaphorase

Lysosomal dysfunction

Neuroprotection

Neurotoxicity

4 o methylphorbol 13 acetate 12 myristate

acridine orange

aminochrome

dihydrolipoamide dehydrogenase

dopamine transporter

neurotoxin

retinoic acid

tyrosine 3 monooxygenase

unclassified drug

vesicular monoamine transporter 2

aminochrome 1

indole derivative

reduced nicotinamide adenine dinucleotide (phosphate) dehydrogenase (quinone)

Article

cell damage

cell differentiation

controlled study

gene expression

immunofluorescence

incubation time

lysosome

pH

priority journal

protein expression

real time polymerase chain reaction

SH-SY5Y cell line

animal

antagonists and inhibitors

drug effect

enzymology

genetics

lysosome

metabolism

mouse

neuroprotection

physiology

tumor cell line

Animals

Cell Line, Tumor

Hydrogen-Ion Concentration

Indolequinones

Lysosomes

Mice

NAD(P)H Dehydrogenase (Quinone)

Neuroprotection