Acetylcholinesterase variants in Alzheimer's disease: from neuroprotection to programmed cell death

By soreq
Created 12/4/2011
By soreq December 4, 2011


Abstract:

BACKGROUND: In Alzheimer's disease (AD), cholinergic neurons are particularly vulnerable for as yet unclear reasons. Here, we report that modified composition, localization and properties of alternative splice variants encoding the acetylcholine-hydrolyzing enzyme acetylcholinesterase (AChE) may be variably involved in disease progression or in systemic efforts to attenuate its progression. OBJECTIVE: The purpose of this study was to explore the implications for AD of the cellular and biochemical properties of the various AChE proteins, differing in their N and C termini. Methods: We have used cell transfection with genetically engineered vectors as well as microinjection to overexpress specific AChE variants and explore the consequences to cellular well-being and survival. Additionally, we employed highly purified recombinant AChE-R and AChE-S to explore putative interactions with the AD beta-amyloid peptide. RESULTS: Our findings demonstrate distinct, and in certain cases inverse cell fate outcome under enforced expression of the human N- and C-terminally modified AChE variants, all of which have similar enzymatic activities. CONCLUSION: The N-terminal extension in conjunction with the primary helical C-terminal peptide of 'tailed' AChE-S facilitates, whereas the shorter, naturally unfolded C-terminus of the stress-induced AChE-R variant attenuates Alzheimer's pathology.

Journal:
Neurodegener Dis

Volume:
7

Pagination:
60-3

Notes:
Learn more about our exciting upcoming events!

read more

Studying at ELSC

Our Int'l Ph.D. program provides outstanding students with top-notch courses in computational neuroscience.

read more

The Building

The Jerusalem Brain Sciences Building will provide a state-of-the-art research and teaching facility for the Edmond and Lily Safra Center for Brain Sciences.

read more

ELSC Media Channel

Get into our media channel and investigate ELSC's latest videos: seminars, public lectures, courses and video articles.

read more

Source URL: http://elsc.huji.ac.il/soreq/publications/acetylcholinesterase-variants-alzheimers-disease-neuroprotection-programmed-cell-