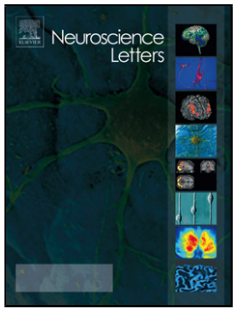

Title: Protective effects of a radical scavenger edaravone on oligodendrocyte precursor cells against oxidative stress

Authors: Hajime Takase, Anna C. Liang, Nobukazu Miyamoto, Gen Hamanaka, Ryo Ohtomo, Takakuni Maki, Loc-Duyen D. Pham, Josephine Lok, Eng H. Lo, Ken Arai

PII: S0304-3940(18)30018-1
DOI: https://doi.org/10.1016/j.neulet.2018.01.018
Reference: NSL 33352

To appear in: *Neuroscience Letters*

Received date: 30-10-2017
Revised date: 26-12-2017
Accepted date: 10-1-2018

Please cite this article as: Hajime Takase, Anna C.Liang, Nobukazu Miyamoto, Gen Hamanaka, Ryo Ohtomo, Takakuni Maki, Loc-Duyen D.Pham, Josephine Lok, Eng H.Lo, Ken Arai, Protective effects of a radical scavenger edaravone on oligodendrocyte precursor cells against oxidative stress, Neuroscience Letters https://doi.org/10.1016/j.neulet.2018.01.018

Protective effects of a radical scavenger edaravone on oligodendrocyte precursor cells against oxidative stress

Hajime Takase[1, 2, 3]*, Anna C. Liang [1]*, Nobukazu Miyamoto[1], Gen Hamanaka[1], Ryo Ohtomo[1], Takakuni Maki[1], Loc-Duyen D. Pham[1], Josephine Lok[1, 2], Eng H. Lo[1], Ken Arai[1]

[1]Neuroprotection Research Laboratory, Departments of Radiology and Neurology, Massachusetts General Hospital and Harvard Medical School, USA

[2]Department of Pediatrics, Massachusetts General Hospital, Boston, MA, USA

[3]Department of Neurosurgery, Graduate School of Medicine, Yokohama-City University, Japan

*These two authors equally contributed to this work.

Corresponding author: Ken Arai, Neuroprotection Research Laboratory, MGH East 149-2401, Charlestown, MA 02129, USA. Tel: +1-617.724.9503, Email: karai@partners.org

Number of words in abstracts: 165

Number of words in text: 2240

Number of figures: 5

Number of supplementary figures: 0

Number of references: 29

Disclosures: none

Highlights:

- Edaravone protected OPCs in a mouse model of prolonged cerebral hypoperfusion.
- Edaravone did not induce cell death in OPC culture
- H_2O_2 exposure or starvation stress caused ROS accumulation in OPCs
- Edaravone protected OPCs against oxidative stress in vitro

Abstracts:

Oligodendrocyte precursor cells (OPCs) play critical roles in maintaining the number of oligodendrocytes in white matter. Previously, we have shown that oxidative stress dampens oligodendrocyte regeneration after white matter damage, while a clinically proven radical scavenger, edaravone, supports oligodendrocyte repopulation. However, it is not known how edaravone exerts this beneficial effect against oxidative stress. Using in vivo and in vitro experiments, we have examined whether edaravone exhibits direct OPC-protective effects. For in vivo experiments, prolonged cerebral hypoperfusion was induced by bilateral common carotid artery stenosis in mice. OPC damage was observed on day 14 after the onset of cerebral hypoperfusion, and edaravone was demonstrated to decrease OPC death in cerebral