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ONLINE ISSN : 1880-1404

PRINT ISSN : 0916-717X

Biomedical Research on Trace Elements

Vol. 16 (2005) , No. 4 293-295

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Oxidative damage of prion protein induced by reactive oxygen species

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(Accepted: October 15, 2005)

Abstract:

Prion protein (PrP) consists of an amino-terminal domain containing a series of octapeptide repeats with the consensus sequence PHGGGWGQ and a carboxyl-terminal domain composed of three α -helices and two short β -strands. Several studies have shown that the amino-terminal domain binds five Cu^{2+} ions. In this study, we have investigated the effect of reactive oxygen species (ROS) on PrP and copper-loaded PrP. In the presence of H_2O_2 or O_2^- , copper-loaded PrP, either an N-terminal fragment or a full-length molecule, underwent degradation and polymerization, whereas PrP without copper did not suffer any oxidative damage upon incubation with the ROS. The oxidative damage on copper-loaded PrP was decreased in the presence of the copper chelators and catalase, but not in the presence of hydroxyl radical scavengers. Together, these results indicate that the copper bound to PrP causes oxidative damage by ROS.

Key words: [prion and reactive oxygen species](#)

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To cite this article:

Noriyuki Shiraishi, Wenxiang Bi and Morimitsu Nishikimi, "Oxidative damage of prion protein

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