

Table 20

ABTS, DPPH, H₂O₂ and Superoxide Radicals Scavenging Potential of Metallothioneins

Findings	ABTS	DPPH	H ₂ O ₂	Superoxide
Present study				
Involvement of isolated MT in scavenging of radicals	Isolated MT was found to scavenge ABTS, DPPH, H ₂ O ₂ and superoxide radicals in a dose dependent manner. Percentage scavenging activity of MT was increased with increasing concentration of AgNO ₃ exposure			
Concentration of AgNO₃ with which MT exhibited maximum activity	4µM (38%)	4µM (45%)	4µM (23%)	4µM (54%)
Earlier findings	<p>Ramana Kumari <i>et al.</i> (1998) revealed that MT I and II were able to scavenge ABTS, DPPH, hydroxyl and superoxide radicals. MT-I appeared to be a superior scavenger of superoxide and DPPH radicals</p> <p>Atif <i>et al.</i> (2006) reported that purified Cd-MT from Indian freshwater fish, <i>Channa punctata</i> Bloch effectively scavenged the free radicals such as superoxide radical O₂⁻, ABTS^{•+} and DPPH^{•+} in a dose dependent manner. Also cysteine residues of MT was anticipated to be the main candidate for its radical scavenging activity</p>	<p>Huang <i>et al.</i> (2014) reported that MT-I and MT-II had the maximum DPPH radical scavenging activity (29 ± 0.1% and 34 ± 0.1%) at 100 µg/ml. They also suggested that cysteine residues in MT-I and MT-II have antioxidant properties which might involve in antiradical activity.</p>	<p>Quesada <i>et al.</i> (1996), studied on the reaction of sulfhydryl groups in MT with hydrogen peroxide (H₂O₂) in human promyelocytic leukemia cells(HL-60). Zinc-metallothionein (Zn-MT) was induced by 24hour treatment of HL-60 cells with ZnCl₂. The ZnCl₂ induced cells were opposed to oxidative stress caused by H₂O₂ than normal cells due to</p>	<p>Hussain <i>et al.</i> (1996) conducted an <i>in vitro</i> experiment which showed that MT is superior in scavenging of superoxide radicals compared to other sulfhydryl molecules namely cysteine, N-acetyl-cysteine and even glutathione. They also revealed that MTs scavenged the superoxide radical in a dose dependent manner.</p>

Table 20 (Contd...)

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Earlier findings	Huang <i>et al.</i> (2014) showed that MT-I and MT-II participated in antioxidant activities against peroxy and hydroxyl radicals.	Lin <i>et al.</i> (2011) illustrated that purified MT protein from Tilapia fish (<i>Oreochromis mossambicus</i>) has been shown to have a higher ability than glutathione to scavenge both DPPH* and ABTS*+.	involvement of cysteine sulfur atoms of MT in the radical quenching process.	Koh and Kim (2001) assessed the effects of MT on the activity of enzymes involved in elimination of reactive oxygen species where higher concentration of MT scavenged the superoxide radical at approximately 80%. Irato <i>et al.</i> (2001) examined the role of MT to scavenge the super oxide radicals in cadmium exposed <i>in vitro</i> cultured rat peritoneal macrophages.