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Construction of HeLa cell lines overexpressing metallothioneins-1 and -2 and their cytoprotective effects against oxidative damage induced by hydrogen peroxide

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Abstract:
It has been suggested that metallothioneins (MTs) play a role to protect cells from toxic effects of oxidative stress and heavy metals. On the other hand, the ability of Cu-containing MT to protect cells from oxidative damage is controversial. In the present study, we have constructed HeLa cell lines overexpressing metallothioneins-1E and -2A for the first time, and have examined cytoprotective effects of MT against oxidative damage induced by hydrogen peroxide (H_2O_2) in these cell lines pretreated with or without Cu. As a result, the HeLa cells overexpressing MT have suppressed oxidative damage induced by H_2O_2 at low concentrations of Cu, suggesting that Cu-containing MT has cytoprotective effects against oxidative damage induced by H_2O_2 if the amount of MT is sufficient to contain Cu in the protein and not to liberate Cu bound to it.

Key words: cell viability, copper, cytoprotective effect, HeLa cell, metallothionein, oxidative stress, overexpression

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