

P102**PROTECTION EFFECTS BY METALLOTHIONEIN IN MOUSE LENS
EPITHELIAL CELL****Takeshi Saito¹, Tomoyuki Tezuka², Ryuichi Konno³, Noriko Fujii⁴**^{1,2,4}Kyoto University, Research Reactor Institute³Dokkyo University School of Medicine, Department of Microbiology^{1,2,4}2-1010, Asashironishi, Kumatori, Sennan, Osaka 590-0494, Japan³Mibu, Tochigi 321-0293, JapanE-mail: ¹ta-saito@HL.rii.kyoto-u.ac.jp, ²tezuka@HL.rii.kyoto-u.ac.jp,³konno@mx.dokkyomed.ac.jp, ⁴nfujii@HL.rii.kyoto-u.ac.jp

[Introduction] The living organisms are constantly exposed to environmental stresses. The protective systems of the organisms against the relevant stresses have developed through evolution. The eye lens is an important organ which plays the part of transmitting the light and refracting it appropriately, in order that this optical information can reach the nervous system correctly. However, when the cellular activity of the lens declines or its protein structure changes due to various stresses, the transparency of the lens is compromised. On this account a lot of protection mechanisms are present in the lens. Metallothioneins (MTs) are proteins which affect the metabolic regulation, maintenance of homeostasis. Until now, there has been very little research on how MTs are induced or how they assist in cell protection in the lens. Therefore we analyzed protection activity of metallothionein-I (MT-I) and metallothionein-II (MT-II) in mouse lens epithelial cell line. **[Methods]** 1) ZnCl₂ solution of various concentration was added to a culture medium of mouse lens epithelial cell line (alpha TN4-1), and then the cells were incubated for 8 hours at 37°C. After incubation, quantities of MT-I and MT-II expression were determined by real-time RT-PCR. 2) ZnCl₂ solution of various concentration was added to a culture medium of alpha TN4-1, and then the cells were incubated for 8 hours at 37°C. After incubation, the cells were exposed to high concentration ZnCl₂, CdCl₂ or UV stress. Furthermore, ³H-thymidine was added to the medium, and then the cells were incubated for 24 hours at 37°C. The amount of ³H-thymidine taken up by the cells was quantified using liquid scintillation counter. **[Results]** MT-I and MT-II mRNA expressed constitutively in alphaTN4-1 cell. In addition, MT-I and MT-II mRNA was induced by the addition of ZnCl₂ and its expression amount increased according to ZnCl₂ concentration. Furthermore, it was found that induction of MT shows protective function against ZnCl₂, CdCl₂ and UV stresses. These results suggested that protective mechanism by MT against various heavy metals and UV-A stresses was present within the eye lens.