

164

Mechanisms of cell death by heat

Yoshito FUJII, Shizuko TOMINAGA, Mizuho NAGASAWA,
Seiji KODAMA, Masami WATANABE ;Div. Radiat. Biol.,Dept. Healh
Sci.,Fac.Pharm. Sci.,Nagasaki Univ.;Nagasaki 852.

Cell death is no longer considered only in terms of catastrophic failure of cell integrity produced by molecular damage. Rather, it is now important to consider whether death is an endpoint of a cascade of common metabolic events. We previously reported that cancer cells are more sensitive to heat than normal cells at confluent growth condition. In this study, therefore, we examined cellular and molecular dynamics in heated normal and cancer cells at confluence. The onset of cell death by heating is associated with nuclear condensation and marked convolution of the cellular surface that are typical apoptic process, suggesting that apoptosis is mainly caused of the cell death by heat in cultured human cells.

165

Complex formation between hsp70 and hsp40 in mammalian cells
Kenzo OHTSUKA¹, Kazuhiro SUGITO², Mitsuo YAMANE²
¹Lab. Exptl. Radiol., Aichi Cancer Center Res. Inst., Nagoya 464,
²Dept. Oral Surg., Nagoya Univ. Sch. Med., Nagoya 466

Recently we identified a novel 40-kDa heat-shock protein hsp40 in mammalian cells and showed that hsp40 is a mammalian homologue of bacterial heat-shock protein DnaJ as determined by cDNA cloning. Here, we examined interaction of hsp70 with hsp40 in several mammalian cells using immunoprecipitation methods

Coimmunoprecipitation between hsp70 and hsp40 could be detected in all cell lines tested. When cells were pretreated with cross linker DSP, more considerable interaction of hsp70 with hsp40 was observed. Upon addition of permanently denatured protein CMLA to the cell lysate, interaction of hsp70 with hsp40 was more evident. Under some experimental condition, hsp70/mutant p53/hsp40 ternary complex could be observed. Recently, it is reported that hsp70 and hsp40 cooperatively bind to nascent polypeptide chains emerging from ribosome and help their correct folding. Thus, our present results suggest that hsp70 indirectly associates with hsp40 mediated by other polypeptides such as unfolded proteins and mutant p53.

166

**Role of heat-shock protein 72 on expression of malignant
phenotypes in cancer cells.**

Ryota Nogami, Atsuko Fujitsu, Seiji Kodama, and Masami Watanabe
(Div.Radiat.Biol.,Dep.Health Sci., Fac.Pharm.Sci., Nagasaki Univ.)

At 37°C, human cancer cells synthesized abnormally high levels of inducible-type of 72-kDa of heat shock protein (hsp72), 8-9 times level of normal cells when the exponentially growing cells were compared, and 1.5-2 times the level of normal cells when cells at confluence were compared. We examined the relationship between the extent of expression of hsp72 and the malignant phenotypes, such as growth rate, growth ability in soft agar and tumorigenicity, in human cancer cells. Results suggest that overexpression of hsp72 may play an critical role to express malignant phenotypes of human cancer cells.