122 **Mechanisms of cell death by heat**

Yoshito FUJII[1], Masao SUZUKI[1], Keiji SUZUKI[2], Yoshie KITAMURA[1], Hiroshi MIURA[1], Masami WATANABE[1]; [1]Div. Radiat. Biol., Dept. Health Sci.,Fac. Pharm. Sci., Nagasaki Univ., Nagasaki 852, and [2]Div. Radiat. Biol., Med., Yokohama City Univ., Yokohama 236.

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. The onset of cell death by heating is associated with nuclear condensation and marked convolution of the cellular surface. Because these change are typical in "apoptotic" process, apoptosis may play a vital role in the cell death by heating.

123 Effects of hyperthermia on M-phase Chinese hamster ovary cells

Kura Shinobu, Antoku Shigetoshi, Kyushu University, Fukuoka 812

Chinese hamster ovary cells were heated at 44°C for 8 min in the M-phase of the cell cycle obtained by mitotic selection. Individual cells and their progeny were photographed by time lapse cinemicrography and followed by single frame analysis of films. The mode of division of cells heated in the M-phase was classified into 4 types as follows. (1)Untill 2 hr after heating, cells divided normally and continued division at normal rate for 2-3 divisions. Thus it seemes that these cells have ability of colony formation. (2) Cells divided immediately after heating but followed by cell fusion of daughter cells. (3) After heating cells failed to divide and underwent in the spread configuration of interphase after a certain period of time. (4) Cells died without division. The fraction of cells of type of (1), (2), (3) and (4) were 8, 19, 45 and 28 %, respectively.

124 Analysis of Heat Sensitivity after Hybridization of Two Cell Lines with Different Heat Sensitivity (II)

Kazuo Sakai, Hiroyuki Ito, and Norio Suzuki; Department of Radiation Oncology, Faculty of Medicine, University of Tokyo, Tokyo 113

We have prepared hybrids of heat-resistant human glioma A7 cells and heat-sensitive Chines hamster V79 cells. After 44°C treatment the survival curves of the hybrid clones distributed between those of A7 and V79.

From one of the hybrid clones, VA41, which were most heat-resistant among the hybrids, 9 subclones were picked up and studied further. The surviving fractions after 44℃-60min treatment of the most resistant subclone, VA41-4, and the most sensitive subclone, FA41-8, were 0.15 and 0.002, respectively, while those of A7 and V79 were 0.18 and 0.0015, respectively.

The modal number of chromosomes in FA41-4 was 32 and that in FA41-8 was 24, suggesting the determinant(s) for heat resistance be located on the "extra" chromosomes in FA41-4.