Chromosomal instability in bystander human lymphocytes incubated with irradiated yeast cells.

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The bystander effect has been widely described in vertebrates, and to a lesser extent in other Metazoa and unicellular organisms. In the present study, we have demonstrated the ability of unicellulates to generate this effect in bystander cells of mulicellular organisms.

Human peripheral blood lymphocytes were cultivated in medium RPMI-1640 at 37 °C for 48 h. At the beginning of the incubation procedure, set of cultures were irradiated by X-ray in dose 1 Gy, than nonexposed and irradiated cultures was experimentally contaminated with nonirradiated or X-ray irradiated yeast *Saccharomyces cerevisiae* (haploid strain, the dose of irradiation was 10 Gy). The preparation of slides for chromosome analysis was performed according to standard procedure. Well spread metaphases were scored for chromosomal aberrations (CA).

It was found that the level of CA was significantly increased in nonirradiated human lymphocytes incubated with irradiated *S. cerevisiae* as compared with control (7.67±1.76% and 2.33±0.88% respectively, $p<0{,}01$). Analysis of the spectrum of CA indicated chromatide type aberrations as the main chromosomal lesions for these experiments. We found no influence of incubation with irradiated yeast cells on the average level of chromosomal instability in X-ray exposed lymphocytes. The chromosome type aberrations were the main chromosomal lesions for noncontaminated and contaminated irradiated lymphocyte cultures, but shift to chromatide type aberrations was observed for CA spectrum of irradiated lymphocytes incubated with irradiated *S. cerevisiae*. The incubation with nonirradiated yeast cells had no effect on lymphocytes chromosomal stability.

Thus, our findings show the evident bystander effect in human lymphocytes incubated with irradiated *S. cerevisiae*. Possible implications of these results will be discussed.

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