

# Analysis of Persistence of Radiation-induced Chromosomal Aberrations

Atsushi KOHDA, Jun-ichiro KOMURA

*Department of Radiobiology*

## Abstract

Among various chromosomal aberrations, translocations are considered to persist over time and through multiple cell divisions. However, the results of our previous study, in which we compared the frequencies of translocations in the splenocytes of the mice irradiated with gamma-rays at various dose-rates, suggest that translocations are not necessarily stable over time and that a substantial fraction of them might be lost during the long time of low dose-rate irradiation. In the present study, we have therefore investigated the persistence (or possible non-persistence) of translocations after irradiation with gamma-rays (accumulated dose: 0.5 or 1 Gy) at a low (20 mGy/day), high (726 mGy/min), or intermediate (1.5 mGy/min) dose-rate. We observed the decrease of translocations over time in most of the experiments. The results suggest that translocations, usually known as stable chromosome aberrations, are not completely stable. This may have a large influence on the estimation of the incidence of chromosome aberrations, and hence on the biological dosimetry by chromosome analysis and on the risk estimation of radiation, especially in the range of low dose-rates.

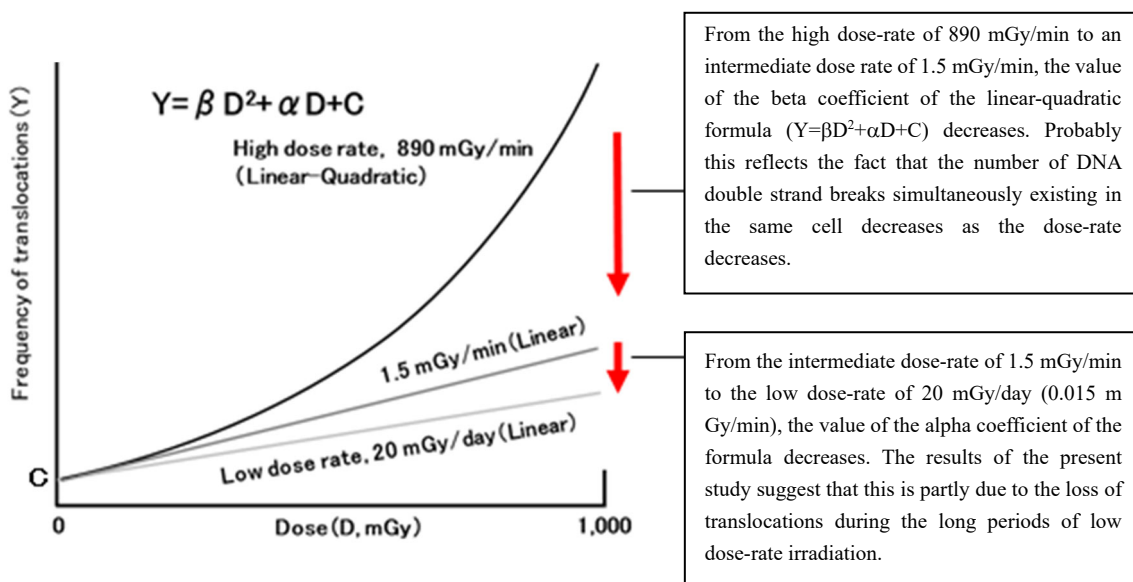


Fig. 1. Transition of the shape of the dose response relationship from “linear-quadratic” to “linear” with the decrease of the dose-rate observed in our previous study

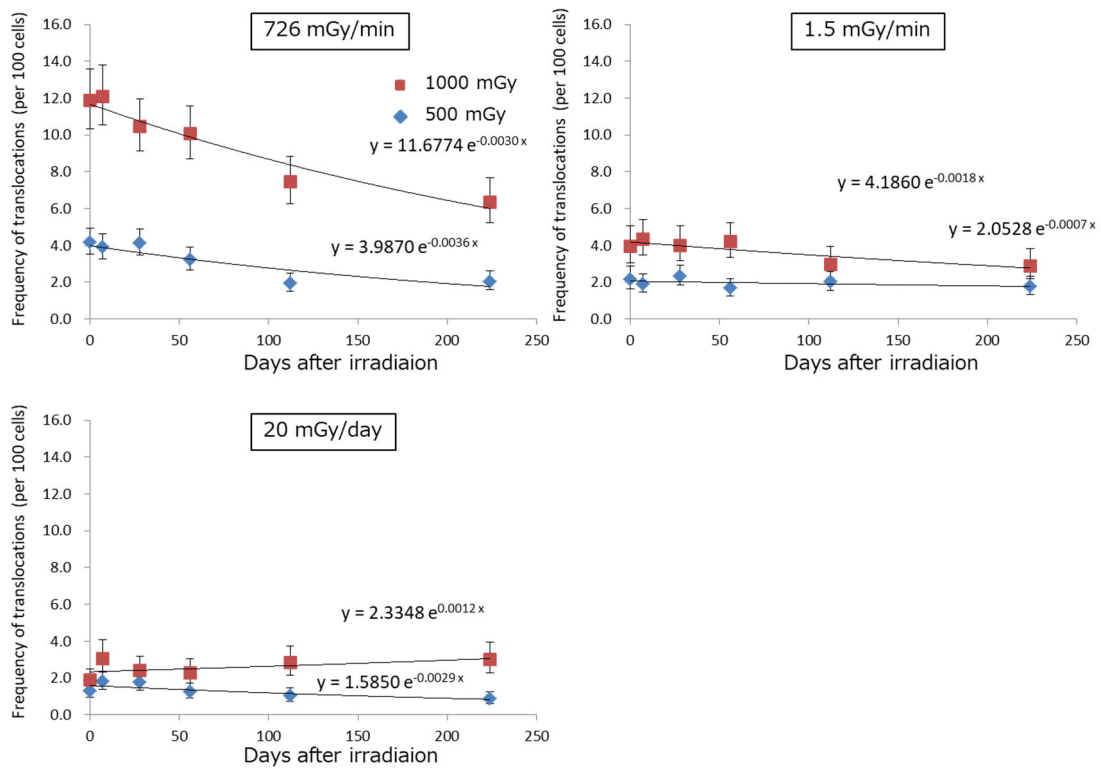


Fig. 2. Decrease in the frequency of translocations over time after irradiation.