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RADIATION RESPONSE OF INTERSPECIFIC HYBRIDS
BETWEEN X-RAY-SENSITIVE MOUSE L5178Y-A4 CELLS
AND X-RAY-RESISTANT HUMAN HeLa RC-355-TG10 CELLS

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Inter- and intraspecific somatic cell hybrids have been used as a tool to study factors controlling the X-ray sensitivity of somatic mammalian cells. In the present study, an X-ray sensitive mouse L5178Y-A4 cell line (BUdR^r) was fused to an X-ray resistant HeLa RC-355-TG10 cell line (TG^r), and the radiosensitivity of the resulting hybrids was investigated. From the X-ray dose-survival curves, it was found that one of the hybrids had higher X-ray sensitivity than that of the resistant parent and lower X-ray sensitivity than that of the sensitive parent. This line was named HAHy5. A line which lost its radiosensitivity to the level of the sensitive parent with the progress of generations was also obtained (named HAHy4-6). All others had similar degrees of X-ray sensitivity to the sensitive parent.

The X-ray sensitivity and the chromosome constitution of the resulting hybrids were compared with those of their respective parents. The HAHy5 line, which was intermediate in sensitivity between the parental cell lines, retained almost all the chromosomes from the sensitive parent and a small number of chromosomes from the resistant parent. On the other hand, the HAHy4-6 line lost its radiosensitivity with the progress of generations, followed by a decrease in the number of human chromosomes. These results suggested that the resistance of the HAHy5 hybrid was related to the human chromosomes which contained a certain gene. By chromosomal analysis of the lines, human chromosomes Nos. 2, 5, 7, 21, m9 (or m10), 18 (or rm17) and rm14 were suggested to be the genes responsible for the X-ray sensitivity.