



# Radiation Survival Curve for Pediatrics Rhabdomyosarcoma Cells

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## I. Introduction:

- Rhabdomyosarcoma (RD) is the most common soft tissue sarcoma of childhood; it tends to occur in head and neck area, bladder, vagina, and in or around the prostate and testes.
- To choose adequate criteria of cell radio-sensitivity and to calculate the characteristic parameters for comparative radiation studies, a survival curve is needed.
- A Cell survival curve describes the relationship between the radiation absorbed dose and the proportion of cells that survive.

## II. Objectives:

- To determine the intrinsic radio sensitivity of the RD cells type.
- To determine the parameters related to survival curve used for the calculations of tumor cell kill in radiotherapy of pediatric tumors, of the type of RD sarcoma.

## III. Methods:

- RD cell lines produced by ATCC were used under their guidelines and recommended media.
- Clonogenic survival assay was used to determine the surviving fractions of the irradiated RD cell lines.

## IV. Results:

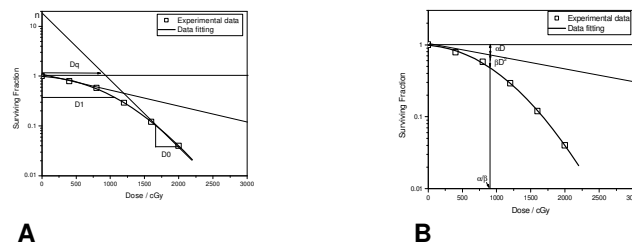


Fig. 1: Shape of survival curve for RD cells exposed to X-ray. **A.** The curve is described by the single-hit multi-targets model ( $D_0=3.6$  Gy and  $n=18$ ), **B.** The curve is described by linear quadratic model ( $\alpha/\beta = 9$  Gy).

## V. Discussion and Conclusions:

- The mean lethal dose  $D_0$  is 3.6 Gy, the quasi-threshold dose  $D_q$  is 9.2 Gy, and the extrapolation number ( $n = 18$ ) are reflect the ability of the RD cells to repair sub-lethal radiation damage.
- $\alpha/\beta$  ratio: Cells displaying  $\alpha/\beta$  ratio (9 Gy) indicate that the conventional dose per fraction of 2 Gy should provide therapeutic gain with an increased probability of tumor cure (TCP) and sparing of late-responding normal tissues (NTCP).
- $SF_4$  value: The high value of  $SF_4$  (0.79%) correlates with the low clinical radiosensitivity of RD cell lines.
- Mechanism of death: Mitotic death is dominant in this type of RD cells

