Clinical and Experimental Radiobiology Course

Tutorial 2

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Tutorial 2

- **Lecture 5: Cell survival and Tumor Growth**
  - ***Dr. Deepak Dinakaran***
- **Lecture 6: Quantifying cell kill and cell survival**
  - ***Dr. Marianne Koritzinsky***
- **Lecture 7: RBE and LET**
  - ***Dr. Patricia Lindsay***

Lecture 5: Cell Survival & Tumour Growth

A single dose of 9Gy causes:

A. **Smaller clonogenic colonies**

B. **Faster tumor stem cell repopulation**

C. **Decreased vascular density**

D. **All of the above**

Reference: L5 slides 18, 28, 34

Lecture 5: Cell Survival & Tumour Growth

Clonogenic cell death…

A. **Takes into account cell redistribution**

B. **Is a measure of intrinsic radiosensitivity**

C. **Only occurs after cell division**

D. **Is measured by a dye-exclusion assay**

Reference: L5 slides 7-11

Lecture 6: Quantifying Cell Kill/Survival

In the Linear-Quadratic model, the α/β ratio is a measure of:

A. **Radiosensitivity**

B. **Cell-survival curve shape**

C. **Cellular proliferation**

D. **Radiation-induced cell-cycle delay**

Reference: L6 slide 13 & 15

Lecture 6: Quantifying Cell Kill/Survival

In vitro cell survival curves as a function of dose should be plotted on a:

A. **Linear scale**

B. **Semi-logarithmic scale**

C. **Double-logarithmic scale**

D. **Any of the above**

Lecture 6: Quantifying Cell Kill/Survival

In vitro, radiosensitivity is quantified by:

A. Surviving fraction for a specified dose level

B. Dose needed for a specific survival level

C. Alpha/beta ratio

D. Slope of the survival curve

Lecture 7: LET and RBE

In terms of the amount of energy deposited in the body (70 kg), drinking a cup of coffee (500 ml) is approximately equivalent to receiving a whole body dose of X-rays of:

A. 7000 Gy

B. 700Gy

C. 7 Gy

D. 0.07Gy

E. 0.0007Gy

Lecture 7: LET and RBE

When compared to Co-60 g-rays, 14 MeV neutron irradiation:

A. **Has a lower RBE**

B. **Has a larger fractionation effect**

C. **Has a higher LET**

D. **None of the above**

Lecture 7: LET and RBE

At what LET does one observe the maximum RBE for most biological effects?

A. 1 keV/µm

B. 10 keV/ µm

C. 37 keV/ µm

D. 100 keV/ µm

E. 1000 keV/ µm