Hong Kong Institution of Physicists in Medicine
Training Course on Basics Radiobiology

Course Content

Physical factors affecting cell survival:-

- Linear Energy Transfer (LET),
- Relative Biological Effectiveness (RBE)
- Therapeutic ratio

Assays for cell survival, radiation cell survival curve & its models:-

- Radiation biology cell culture & animal models (monolayer & suspension cell culture, spheroids, 3-D cell culture, mouse model, immunodeprived mouse model & transgenic mouse models)
- Regrowth curves after radiation, clonogenic assay, MTT & WST assays
- In vitro, in vivo & in situ methods for cell survival & damage determination
- Cell survival curves, experimental protocol to determine cell survival curve, Single hit, multiple targets model, two component model, early & late responding tissues
- Linear quadratic model, α & β cell kill, α/β)

Introduction of 5R in Radiobiology

Radiation damage & radiation Repair:-

- Inherent cell & tissue Radiosensitivity.
- DNA strand breaks & chromosome breaks; dicentric & acentric chromosomes.
- Radiation sublethal damage repair (SLDR) & potentially lethal damage repair (PLDR)
- Dose rate effect.

Acute Radiation Syndrome (ARS) & Biological dosimetry:-

- Haematopoietic syndrome, gastrointestinal syndrome, central nervous syndrome.
- Biological indicators for radiation dosimetry (lymphocyte count, chromosomal aberration assay, micronuclei assay) & electron Spin Resonance (ESR)

Oxygen effects, hypoxia & biological modifiers:-

- Oxygen effects, hypoxia & its model, tumor reoxygenation
- Radiosensitizers, halogenated pyrimidines; radioprotectors

RT fractionation & Biologically effective dose (BED):-

- dose rate and fractionation
- Hyperfractionation and accelerated treatment
- Influence on therapeutic ratio by dose, dose-rate &, RT fraction numbers
- Isoeffect curves, NSD system, quality of irradiation
- Biologically effective dose (BED)
- Changes of RT schedule by BED calculation.

Cell cycle effect in radiobiology:-

- Radiation sensitive & resistant cell cycle phases
- The effects of Redistribution
- Inverse dose rate effect.

Tumor kinetics & hyperthermia:-

- Cell synchronization
- cell cycle indices, labeling index, PLM technique

- Tumor potential doubling time (Tpot)
- Tumor volume doubling time
- Cell loss factor
- Hyperthermia

Tumor and normal tissue radiobiology:-
- Normal tissue damage (early & late)
- Concept of normal tissue tolerance
- Factors influencing tolerance
- Effects of radiation on different organs
- Organ tolerance to retreatment with radiation
- Effects on embryo & foetus
- Parenchymal & stromal injury

Date, Time and Venue:

The course will be held on:

Date	Time
7 December 2013	2:00pm-5:00pm
14 December 2013	2:00pm-5:00pm
21 December 2013	2:00pm-5:00pm
4 January 2014	2:00pm-5:00pm
11 January 2014	2:00pm-5:00pm

Duration of course:
15 hours lectures, Q&A

Venue:
Room 1102, 11/F, Li Shu Pui Block,
Nursing School, Hong Kong Sanatorium & Hospital

Speaker
Dr. Timothy Yip, Ph.D.
Scientific Officer (Medical)
Radiation Oncology Department
Queen Elizabeth Hospital
Kowloon.

Target participants:
Physicists, doctors, radiographers, radiation therapist, biomedical engineers.
Preference will be given to applicants who are currently working with imaging and radiation therapy in hospital environment.

Assessment:
Q&A and exercise.

Accreditation:
This course has been approved by the Hong Kong Institution of Physicists in Medicine.
15 CPD credits is approved by Hong Kong Radiographer's Board
15 CMD units is approved by Medical Dosimetrist Certification Board
CME accreditation by College of Radiologists (pending for approval)

Teaching Medium
The course will be conducted in English

Tuition Fee:
HKD $600 (HKIPM member)
HKD $1200 (member of HKART and HKRA)
HKD $4,000 (NON-HKIPM member)

* A 50% discount will be given to HKIPM members from the hospital that provides venue for the training.

Enrollment:
Completed registration form shall be sent with a cheque for the tuition fee to Ms. Ruby Ho, Secretary of the Hong Kong Institution of Physicist in Medicine at the address give below. The cheque should be crossed and made payable to "Hong Kong Institution of Physicists in Medicine". (Full payment must be made and no refund for withdrawal will be entertained due to any circumstances).

Ms. Ruby Ho
Medical Physics & Research Department
8/F, Li Shu Fan Block
Hong Kong Sanatorium & Hospital
2 Village Road
Happy Valley
Hong Kong Island .

Closing Date for Application:
Saturday 30 November 2013