



Association of Radiotherapy and Oncology of the Mediterranean area
4, Square Alain Fournier, 75014 Paris

2nd DELINEATION TRAINING AND RADIOBIOLOGY AROME COURSE

LARESPARK HOTEL TAKSIM – ISTANBUL
May 18-21, 2011



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COURSE DIRECTORS

Radiobiology

Prof. Barry S. Rosenstein

Prof. Martin N. Pruschy

Delineation training

Prof. Mahmut Ozsahin

Prof. Yazid Belkacemi

Prof. Sedat Turkan

Teachers

Prof. Yazid Belkacemi,

Prof. Şefik İğdem

Prof. Abraham Kuten

Prof. Mahmut Ozsahin

Dr. Fresia Pareja

Prof. Martin N. Pruschy

Prof. Barry S. Rosenstein

Dr. Yuval Shaked

Prof. Jan Wondergem

Prof. Yosef Yarden

WEDNESDAY, MAY 18, 2011 - AFTERNOON SESSION

13:00-13:30 Registration

SESSION I: 3D-CONFORMAL RADIOTHERAPY DELINEATION COURSE

13:30-15:30 Volume definition in pelvic cancers

Chairs: Prof. Yazid Belkacemi, Prof. Şefik İğdem, Dr. Pauletta G. Tsoutsou

13:30-13:50 Elastic deformation and fusion: MIMvista performances

Speaker: Dr. Cécile Ortholan

13:50-15:30 Delineation training session

Volume delineation in prostate cancer (Dr. Pauletta G. Tsoutsou)

Volume delineation in rectal cancer (Dr. Cécile Ortholan)

3D volume definition for Brachytherapy in cervix cancer (Dr. Christine Haie-Meder. to be confirmed)

15:30-16:00 Coffee break

SESSION II: AROME-CONSTRUCTORS PARTNERSHIP SESSION

16:00-17:30 New technologies: your dreams today and tomorrow!

Chairs: Prof. Abraham Kuten, Prof. Sedat Turkan, Physicist (to be confirmed)

TOMOTHERAPY

Speaker: Prof. Mahmut Ozsahin (Lausanne, CH; to be confirmed)

CYBERKNIFE

Speaker: Natalie Chadeau (To be confirmed)

VERO System: First experience with the novel VERO SBRT system

Speaker: Tom Depuydt (Brussels, Belgium)

TrueBeam: Technical choices in evolution of linear accelerators

Speaker: Vincent Ronflé (Varian)

Discussion

18:30 Concluding Remarks

19:00-20:00 Welcome Cocktail

Free evening

AROME RADIOBIOLOGY COURSE

THURSDAY, MAY 19, 2011 – FULL DAY SESSIONS

8:15-8:30 Introduction

Prof. Sedat Turkan, Prof. Abraham Kuten

Candidates for the 2011 AWARD of the RB SUMMARY COURSE (AROME Junior Network)

COURSE I: BASIC PRINCIPLES OF RADIOBIOLOGY

8:30-09:15 Teacher: Prof. Barry S. Rosenstein

The Physics and Chemistry of Radiation Absorption

- a) Types of ionizing radiation
- b) Description of electromagnetic radiation
- c) Direct and indirect ionizing radiation
- d) Direct and indirect action of radiation
- e) Photoelectric effect, Compton process and pair production
- f) Radiation chemistry
- g) Evidence suggesting DNA as the target for ionizing radiation

09:15-10:15 Teacher: Prof. Martin N. Pruschy

Hallmarks of Cancer

- a) Hallmarks of Cancer-Cancer Biology
- b) The reductionist view of Cancer Biology
- c) The heterotypic cell biologist view of Cancer Biology
- d) 4/5 R's of Radiotherapy (Introduction)
- e) Linking Hallmarks of Cancer to 4/5 R's of Radiotherapy

10:15-10:30 Coffee Break

10:30-11:30 Teacher: Prof. Martin N. Pruschy

Modes of (Radiation-Induced) Cell Death

- a) Different modes of IR-induced cell death
- b) Apoptosis
- c) Autophagy
- d) Senescence
- e) Mitotic catastrophe
- f) Early vs late cell death

11:30-12:30 Teacher: Prof. Barry S. Rosenstein

Cell- Survival Curves

- a) Determination of *in vitro* cell survival curves
- b) Target theory
- c) Linear quadratic models
- d) The α/β value and the effect of dose fractionation
- e) Effective dose- response curves
- f) Survival curve calculations

- g) Principles of tumor control probability and dose- response relationships
- h) Tumor control probability calculations
- i) Tumor control vs risk of normal tissue complications – Risk–benefit analysis

12:30-13:15

Light Lunch

13:15-14:00

Teacher: Prof. Martin N. Pruschy

DNA Damage Response

- a) Types of DNA damage
- b) DNA damage/double strand breaks sensing
- c) DNA repair
- d) Non-homologous end joining
- e) Homologous recombination

14:00-14:30

Teacher: Prof. Barry S. Rosenstein

Radiation Damage and the Dose–Rate Effect

- a) Potentially lethal damage repair
- b) Sublethal damage repair
- c) Effects of hypoxia and LET on PLDR and SLDR
- d) Dose rate effect
- e) Radiolabelled immunoglobulin therapy
- f) Brachytherapy – LDR and HDR; interstitial and intracavitary use

14:30-15:15

Teacher: Prof. Martin N. Pruschy

Radiation-Induced Cell Signalling

- a) Radiation and cell cycle checkpoints
- b) DNA damage-dependent signalling
- c) DNA damage–independent cell signalling

15:15-15:30

Coffee Break

15:30-16:30

Teacher: Prof. Barry S. Rosentein

Time, Dose and Fractionation in Radiotherapy

- a) Strandquist plots
- b) NSD, TDF and CRE and problems with their use
- c) Evidence supporting the theory that the α/β ratio for early responding tissues and tumors is greater than the α/β for late responding tissues
- d) Relationship between biologically effective dose, total dose and fraction size
- e) Biologically effective dose (BED)
- f) Hyperfractionation
- g) Accelerated treatment
- h) BED Calculations

16:30-17:15

Teacher: Prof. Jan Wondergem

Hyperthermia

- a) Methods to achieve localized heating
- b) Possible targets heat-induced lethality
- c) Effect of pH and nutrient deficiency on sensitivity to heat

- d) Hypoxia and hyperthermia
- e) Thermotolerance
- f) Heat dose
- g) Hyperthermia combined with irradiation
- h) Thermal enhancement ratio
- i) Time sequence of heat and irradiation
- J) Hyperthermia and low dose rate irradiation

FRIDAY, MAY 20, 2011 – FULL DAY SESSIONS

COURSE II: PRINCIPLES OF CANCER BIOLOGY: APPLICATION TO RADIOBIOLOGY

	Intracellular pathways: governance of cell death and survival
8:30-9:30	Teacher: Dr. Fresia Pareja and Prof. Yosef Yarden
	Intracellular pathways
9:30-10:30	Teacher: Dr. Yuval Shaked
	Mechanisms of Cell Death and Survival
	a) Apoptosis
	b) Angiogenesis/hypoxia and tissue invasion
	c) Proliferation
10:30-10:45	Coffee Break
10:45-12:30	Teacher: Prof. Martin N. Pruschy
	Targeting Tumor Hypoxia and Angiogenesis
	a) Molecular responses to hypoxia
	b) Radiation and tumor hypoxia pathways
	c) Angiogenesis and radiation effect on the endothelium
	d) Targeting tumor hypoxia and radiation
	e) Targeting tumor angiogenesis and radiation
	Targeting Tumor Repopulation
	a) Tumor repopulation
	b) Normal tissue repopulation
	c) Radiation and repopulation pathways
12:30-13:15	Light Lunch
13:15-14:00	Teacher: Prof. Barry S. Rosenstein
	Radioprotection and Radiation Exposures Risks
	a) Doses and risks associated with natural and medical radiation sources
	i) Sources of radiation to the human population
	ii) Effective dose equivalent
	iii) Genetically significant dose
	b) Effects of radiation on the embryo and foetus
	c) Hereditary effects of radiation

- i) Radiation-induced genetic effects
- ii) Measurement-induced genetic effects
- iii) Genetic risk in humans
- d) Radiation carcinogenesis
- i) Stochastic and non-stochastic effects of radiation
- ii) Irradiated populations
- iii) Cancer incidence as a function of dose (leukaemia, breast, bone, skin and lung)

14:00-15:30

Teacher: Prof. Martin N. Pruschy

Targeting Molecular Elements for Radiosensitization

- a) Modifying radiation responses
- b) Combined radiotherapy with chemotherapy
- c) Antibodies and small molecules
- d) Cancer stem cells as targets

15:30-15:45

Coffee Break

15:45-16:30

Teachers: Prof. Mahmut Ozsahin and Prof. Yazid Belkacemi

Benefit-risk of targeting pathways with combined treatments in clinical practice

- a) Targeting EGFR/HER2
- b) Targeting P13K/Akt-pathway
- c) Targeting angiogenesis
- d) Toxicity prediction

16:30-17:30

Teachers: Prof. Abraham Kuten and Prof. Yazid Belkacemi

Risk of Radiation Carcinogenesis in Clinical Practice

- a) Radiation-induced malignancies after radiotherapy
- b) Risk of low doses in radiation therapy

Free evening

