

European training course in radiobiology

Inter-individual variability of radiation-sensitivity: Mechanisms and Biomarkers

Organized by Institut Curie & CEA, France
in collaboration with the M2 and PhD School of Oncology, Paris-Sud University
Sponsored by the European NOE consortium DoReMi

Week 1 : Monday 9th December to Friday 13th December 2013
Lectures at Institut Curie, Paris, 75005

Monday 9th December: Chairman: Jean-Luc Ravanat (CEA)

- Welcome and introduction
- The formation and detection of DNA and protein lesions after low dose and dose rate exposures and links to oxidative stress

Total lecture time: 5hrs 30mins

9-9:45	Janet Hall (IC), Sylvie Chevillard (CEA), François Leteurtre (CEA) and teaching staff	Welcome, housekeeping, outline of course and introduction of students and teaching staff*
9:45-10:15	Coffee break	
10:15-11	Eric Deutsch (IGR, Villejuif)	Individual susceptibility to IR: a clinician's point of view
11 - 12	Dominique Laurier (IRSN, Paris)	Cancer vs Non cancer effects after low dose IR exposure
12 - 13	LUNCH	
13- 13:45	Marie-Anne Penhoat (IMPIC, Paris)	Radiation quality
13:45-15:15	Évelyne Sage (IC) Jean-Luc Ravanat (CEA, Grenoble)	DNA lesions: formation and detection
15:15-15:45	Coffee break	
15:45-16:30	Meng-Er Huang (IC)	Measuring oxidative stress: challenges, limitations and perspectives
16:30 - 17:15	Corrine Dupuy (IGR, Villejuif)	Oxidative stress and thyroid carcinogenesis – a practical example
17:15 - 17:45	Group meetings for preparation of presentation last day	
17:45	Welcome Cocktail	

*all students and teaching staff to prepare one slide to be presented in 2 minutes explaining who they are and where they are from.

Tuesday 10th December: Chairman: Sarah Lambert

- Radiation exposure and the 3 Rs – repair, recombination and replication

Total lecture time: 7hrs

9-10:30	Pablo Radicella (CEA)	Overview 3Rs and inter-individual variability
	Pablo Radicella (CEA)	Base excision repair and the impact of oxidative stress on enzyme function
10:30-11	Coffee break	
11-12	Wim Vermeulen (DOREMI/Erasmus MC, Rotterdam)	How to measure DNA repair <i>in vivo</i>
12-13	LUNCH AND GROUP PHOTO	
13-13:45	Jean-Baptiste Charbonnier (CEA)	How macromolecular structure influences repair
13:45-14:30	Sarah Lambert (IC)	The links between genome instability and replication
14:30-15:30	Jean-Pierre Quivy (IC)	Epigenetic changes induced by DNA damage
15:30 - 16	Coffee break	
16- 17	Sylvie Sauvaigo (LXRepair, Grenoble)	How to assess the inter-individual variability in DNA repair
17-18	Jeannine Lallemand (EDF, Paris)	Post-accident Fukushima and worker radioprotection

Wednesday 11th December: Chairman: François Leteurtre

- Cell signalling, post-translational modifications and their consequences

Total lecture time: 6hrs 30 mins

9-11	François Leteurtre (CEA) Valerie Schreiber (UMR 7242, Strasbourg)	Signalling pathways <ul style="list-style-type: none"> - Signalling pathways involving kinases and phosphatases - PARP and other post-translational modifications
11-11:30	Coffee break	
11:30-12:30	Anne Peyroche (CEA)	<ul style="list-style-type: none"> - Ubiquitylation and the proteasome - Sumoylation
12:30-13:30	LUNCH	
13:30-15	Vincent Favaudon (IC) Carl Mann (CEA)	Death after radiation exposure <ul style="list-style-type: none"> - Overview - Apoptosis and mitotic cell death - Senescence
15: 15:30	Coffee break	
15:30-16:30	Serge Candéias (CEA)	Effects of irradiation on inflammation
16:30-17:30	Houssein El-Saghire (Doremi/SCK-CEN, Brussels)	EPICT presentation: Gamma H2AX measurements and expression
17:30-18	Time for preparation of student presentations	

Thursday 12th December: Chairman: Sylvie Chevillard

- Genetic instability and epigenetic changes induced by radiation exposure

Total lecture time: 6hrs

9-9:30	Chantal Desmaze (CEA)	Genetic instability and chromosome aberrations
9:30-10:30	Arturo Londono (IC)	Telomere and genetic instability
10:30-11:00	Coffee break	
11:00-11:45	Nicolas Fortunel (CEA)	Stem cells: radioresistant or radiosensitive?
11:45-12:30	Julie Bensimon (CEA)	Cancer stems: radioresistant or radiosensitive?
12:30-13:30	LUNCH	
13:30-14:30	Olivier Brison (IC)	DNA Fragile sites and genetic alterations
14:30-15:30	Fatima Mechta-Grigoriou (IC)	MiRs and Ovarian cancer links to oxidative stress
15:30-16	Coffee break	
16-17	Sylvie Chevillard (CEA)	Cytogenetic and molecular characterisation of radiation-induced tumours and identification of biomarkers of radiation sensitivity
17-18	Time for preparation of student presentations	

Friday 13th December: Chairman: Janet Hall (IC)

- Epidemiology and Biomarkers: the logistics and ethics of the collection and storage of biological samples and their use

Total lecture time: 3hrs30 mins

9-10	Elisabeth Cardis (DOREMI/CREAL, Barcelona)	Radiation, genetic and molecular epidemiology and the assessment of individual susceptibility
10 -10:45	Janet Hall (IC)	What makes a good biomarker and useful biological samples
10:45 – 11:15	Coffee	
11:15 - 12:15	Annette Schmitz (CEA)	Organising and use of a biobank – ethical constraints
12:15 -13.15	Jorg Tost (CEA IG)	High through-put-analyses – what they can tell us about the consequences of radiation exposure?
13.15-14	Lunch	
14 - 16	Student presentations	
16:00 – 16:30	Discussion and course evaluation	

Week 2 : Practical sessions at CEA Saclay

CEA transport facilities between Paris and Saclay will be used
Arrival at 8:15, departure at 16:55

Monday	Tuesday	Wednesday	Thursday	Friday
Security clearance: badge delivery	Planning meeting	Planning meeting	Planning meeting	Planning meeting
Organisational and security remarks	Sensitivity of 8-oxoG excision activity to oxidative stress	FACS analyses: * γ H2AX / Wip1 phosphatase Immunofluorescence: * γ H2AX / Wip1 phosphatase * Cell cycle (BrdU)	DNA & RNA extraction qPCR & PCR, genotyping	Cell cycle analysis: multiple approaches to extract useful information
				Analysis and discussion of the results obtained by the students in different sets of samples.
				DNA repair biochips
Lunch provided at CEA facilities (11:50 - 12:50)				
DNA repair biochips	Sensitivity of 8-oxoG excision activity to oxidative stress	FACS analyses: * γ H2AX / Wip1 phosphatase Immunofluorescence: * γ H2AX / Wip1 phosphatase * Cell cycle (BrdU)	DNA & RNA extraction qPCR & PCR, genotyping	TP course evaluation
				Departure 15h
Discussion of Day's progress	Discussion of Day's progress	Discussion of Day's progress	Discussion of Day's progress	