
Molecular, cellular & tissue effects of particle radiation, 8 - 12 July 2024

Venue: Centre François Baclesse, Caen, France,

Organizers: University of Caen-Normandy and Centre Francois Baclesse, Caen

Targets: young researchers, master student, PhD students, radiation protection officers and medical doctors

Total number of applications: 26

Number of students joined the course: 19 include 11 females and 8 males, 6 PhD students (1 physics and 5 biologists), 4 master students (1 radiochemist, 3 physicists) and 9 young researchers (7 biologists, 1 radiochemist and 1 physicist)

Country of origins: France, Germany, Mecedonia, Uganda, Georgia, Sweden, Norway, Latvia, Slovakia and Ireland

List of invited lectures and their organization:

- Pr. Bo Stenerlöw, Uppsala University, Sweden
- Dr. Serge Candeias, CEA, France
- Dr. Laure Sabatier, CEA, France
- Dr. Samuel Valable, Cervoxy team, CNRS, Caen
- Dr. Carine Laurent, Unicaen, Centre Francois Baclesse, France
- Dr. Omid Azimzadeh, BFS, Germany
- Dr. Simone Mörtl, BFS, Germany
- Dr. Yasmin Lassen, Aarhus particle radioterapy centre, Denmark (on site)
- Dr. Elie Besserer-Offroy, ANTICIPE team, UniCaen

Organizers:

Pr. Siamak Haghdoost, UniCaen

Pr. Jacques Balosso, Centre Francois Baclesse, Caen, France

Comments about the course program and budget:

The course started Monday 8th July through our Friday 12th July with total 26 hours lectures, 3 hours study visit of hadron therapy center and 1.5 hours of oral presentation of posters. Nine posters were prepared by students (2 students for 1 poster) during the course.

Generally, the students gave score 4.4 of 5 for the quality of the course and for the question regarding the levels of knowledge acquired 4.4 of 5, please check Annex II for more information.

The budget covered costs related to students' accommodations, lunches and 2 coffee breaks per

day. The airplane and train tickets, accommodations and meals for teachers who came from outside of Caen were also paid by this budget.

A dinner was organized 11/7 at a restaurant in Caen city, own budget, and all students joined the dinner.

Program: Annex I

Monday 8/7 - day 1

Information about the course 9:00-9:30 (0.5 h) (Siamak Haghdoost and Jacques Balosso)

Coffee break

10:00-12:00: Radiobiological basis of particle irradiation-induced healthy tissue effects (2h) – **Siamak Haghdoost**, UniCaen, France

Lunch: 12:00-13:30

13:30-15:00: Clinical bases for using particle therapy (1.5 h) – **Pr. Jacques Balosso**, Centre Francois Baclesse, Caen, France

Coffee break

15:20-16:50: Cerebral/vascular effects of paediatric protontherapy (1.5 hours), **Dr. Yasmin Lassen**, Aarhus, Denmark

16h50-17h30: Splitting of students into groups, and selection of subject for poster

(Siamak Haghdoost and Pr. Jacques Balosso)

Tuesday 9/7

9:00-10:30 Effect of particle radiation on cardio and vascular system (1.5 hr), **Dr. Omid Azimzadeh**

BFS, Germany

Coffee break

11:00-11:45 Part 1 microRNA signature of proton and C-ions irradiation (1.5 hr) – **Dr. Simone Mörtl**, BFS, Germany

Lunch 11:45-12:45

12:45-13:30 Part 2 microRNA signature of proton and C-ions irradiation (1.5 hr) – **Dr. Simone Mörtl**, BFS, Germany

This partnership has received funding from the European Union's "EURATOM" research and innovation program under the 101061037 grant agreement.

13:35-15:05 Cytogenetic effects of particle irradiation (1,5hr), **Dr. Laure Sabatier**, CEA, France

Coffee

break

15:30-

18.00

Group 1 to 5: Working with preparation of presentations, **Siamak Haghdoost and Jacques Balosso**

Wednesday 10/7

9:00-10:30, Targeted radionuclides therapy, Dr. **Elie Besserer-Offroy**, Anticiple laboratory, UniCaen

Coffee break

11:00-12:30: Particle radiation and oxidative stress (1.5 hours), Dr. **Carine Laurent**, ABTE, UniCaen

Lunch

13:30-14:30: Research seminar on particle radiation (1 hour), **Dr. Zacharenia Nikitaki**, Unicaen

14:30-15:45 use of particle radiation for treating hypoxic tumors (1.15 hour), Dr. S Valable, ISTCT laboratory, CNRS, Caen

Coffee break

16:00-17:00: Study time (1 hour), preparation of presentation (**Siamak Haghdoost and Jacques Balosso**)

Thursday 11/7

9:00-10:30 DNA damage signalling and repair of complex DNA damage induced by Particle radiation (1.5 hours), **Pr. Bo Stenerlöv**, Uppsala University, Sweden

Coffee break

11:00-12:30: Effect of particle irradiation on immune system (1,5h), **Dr. Serge Candeias**, CEA, France

Lunch

13:30-16:00: Siamak Haghdoost and Jacques Balosso: Group 1 to 5: Tutorials and working with preparation of presentations (2.5 hr)

Friday 12/7

9:00-10:30 Examination, poster presentation, PPT, Siamak Haghdoost and Jacques Balosso

Coffee break

Continue examination, Siamak Haghdoost and Jacques Balosso

Lunch

13:00- Study visits: Radiotherapy department Baclesse and CYCLHAD (3 hr)

Teaching group :

Pr. Jacques Balosso, Centre Francois Baclesse, Caen, France

Dr. Omid Azimzadeh, BFS, Germany

Dr. Simone Mörtl, BFS, Germany

Dr. Yasmin Lassen, Aarhus, Denmark

Dr. Elie Besserer-Offroy, ANTICIPE, UniCaen

Dr. Zacharenia Nikitaki, Unicaen

Pr. Bostenerlöw, Uppsala University, Sweden,

Dr. Serge Candeias, CEA, France

Dr. Laure Sabatier, CEA, France

Dr. Samuel Valable, Cervoxy team, Caen

Dr. Carine Laurent, Unicaen, ABTE/TixEMAC, France Pr.

Siamak Haghdoost, UniCaen

Evaluation of the course: Annex II

19 participants, 17 answered the
questioner

General evaluation of the course

Please answer each question in one column by giving a numeric value between 1 and 5: 1=lowest, 5 = highest. Also: 1=no; 5=yes.

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| What is your general view about the quality of the course? | 4.4 |
| Did the content of the course match your expectations? | 4.4 |
| How difficult was it to follow the theoretical parts of the course? | 3.0 |
| Did you have enough basic knowledge to follow the course? | 3.8 |
| Would you have preferred to hear more lectures? | 2.6 |
| Would you have preferred to do more practical work? | 4.0 |
| How much knowledge did you acquire from the course? | 4.1 |
| Did you miss certain subjects that you think would have been relevant? | 2.1 |
| What did you think of lecture on the Radiobiological basis of particle irradiation-induced healthy tissue effects lecture? | 4.7 |
| What did you think of the lecture on Clinical bases for using particle therapy, lecture? | 4.4 |
| What did you think of lecture on the Particle radiation and oxidative stress? | 4.0 |
| What did you think of lecture on the Targeted radionuclide therapy | 4.6 |
| What did you think lecture on of the microRNA signature of proton and C-ions irradiation? | 4.6 |
| What did you think of lecture on the Cerebral/vascular effects of pediatric proton therapy? | 4.3 |
| What did you think of lecture on the use of particle radiation for treating hypoxic tumors? | 4.6 |
| What did you think of lecture on the DNA damage signalling and repair of complex DNA damage induced by Particle radiation? | 4.5 |
| What did you think of lecture on the Effect of particle irradiation on immune system? | 4.3 |
| What did you think of lecture on Cytogenetic effects of particle irradiation? | 3.8 |

Please give written comments that will help us to improve the course (one comment per row below)

Too long days, finish classes earlier in the afternoon

Thank you very much for wonderful course

Good scientific levels of lectures, liked particularly lectures about Hypoxia and radionuclide therapy

Some lectures were a bit hard for me to follow as some lectures were research oriented

Some practical moments in the course would be good

Very satisfied with course, presentations could be given to students 1-2 days before start

Involvement of more physicist as teacher

More about H2AX and 53BP1 assay

Better to have people with different scientific background in one group

Include more basic radiation physics

Including half a day free would be great for exploring Caen

More onsite and less online lectures

Including lectures on new therapy modalities such as flash, Grid, combination therapy would be great

Amazing course, better is shorter days

More exercise questions during the lectures

Less time for preparation of poster
Good food,
good accommodations etc