

COURSE 1

Measuring radiation-induced DNA damage, DNA repair and cell death: radiation biology in lab practice

Organiser: Stockholm University, Sweden



Dates: 17.10.2022 – 21.10.2022

Course description:

General information

The aim of the course is to acquaint participants with the state of the art of cellular effects of ionising radiation which are of relevance for the broad field of radiation research. The target group are students and young researchers with various backgrounds who want to get a basic introduction to biological effects of radiation. The course contains both lectures and practical laboratory work. The lectures will be at a level understandable for non-biologists and will focus on SINFONIA-relevant aspects of biological effects of ionising radiation as well as on techniques to detect them using cytogenetics and immunogenetics.

The practical part will focus on teaching the classical laboratory techniques used to study cellular effects of radiation in cells: the clonogenic cell survival test, analysing chromosomal aberrations by the Giemsa methods and in situ hybridization with whole chromosome probes as well as the gamma H2AX focus assay. Participants will learn how the techniques are carried out and how samples are analysed. Every student will have a microscope at his/her disposal to analyse slides for chromosomal aberrations and micronuclei. Painted chromosomes and gammaH2AX foci will be analysed on computer images.

A participation diploma with 1.5 ECTS credit points (corresponding to one week of education at the Stockholm University) will be given to participants who participate for the whole week.

Financial information

The courses are offered for **free**, but participants must cover their own costs associated with travel and lodging.

Logistics

The course will take place at the Stockholm University, Svante Arrheniusväg 20C, 106 91 Stockholm. SU has no lodging facilities; participants should find their own accommodation in one of the numerous youth hostels or hotels in Stockholm. Information can be provided upon request.





Application

Please submit your application by email to **Andrzej Wojcik** at andrzej.wojcik@su.se. Please include the following documents:

1. A letter of application
2. A CV with a description of the scientific career
3. A supporting letter from the supervisor/head of laboratory

The **deadline for applications is August 31st, 2022**. Confirmation of participation will be sent by **Friday, September 9th, 2022**.

The number of participants is limited to 12.

Course contents and laboratory activities:

The course is divided into lectures and laboratory work as described below.

Lectures will take place in **Room E306**.

Practical work will take place in **Room E214**.

Programme:

Monday, 17 October

09:00 - 10:15 Lecture: Radiation-induced DNA damage, repair and cell death

Lecturer: Andrzej Wojcik

10:30 – 12:00 Guided tour of radiation exposure facilities installed at the Stockholm University.

Analysis of clonogenic cell survival results.

13:30 – 17:00 Group 1: Lab: clonogenic cell survival – practical work

Group 2: Lab: chromosomal aberrations – practical work

Evening free

Tuesday, 18 October

09:00 - 10:15 Lecture: Radiation-induced chromosomal aberrations and micronuclei

Lecturer: Prabodha Kumar Meher

10:30 – 12:00 Microscopic analysis of chromosomal aberrations

13:30 – 17:00 Group 1: Lab: chromosomal aberrations – practical work

Group 2: lab: clonogenic cells survival – practical work

Evening: reception with Swedish food tasting



Wednesday, 19 October

09:00 - 10:15 Lecture: Factors influencing cellular radiosensitivity

Lecturer: Lovisa Lundholm

10:30 – 12:00 Microscopic analysis of micronuclei

13:30 – 17:00 Group 1: Lab: Fluorescence in situ hybridisation

Group 2: lab: DNA repair gamma H2AX foci

Evening free

Thursday, 20 October

09:00 - 10:15 Lecture: Individual sensitivity to radiation – biomarkers and implications for radiological protection

Lecturer: Andrzej Wojcik

10:30 – 12:00 Analysis of gammaH2AX foci and aberrations after fluorescence in situ hybridisation

13:30 – 17:00 Group 1: Lab: DNA repair gamma H2AX foci

Group 2: lab: Fluorescence in situ hybridisation

Evening free

Friday, 21 October

09:00 - 11:30 Presentations of analysed results and general discussion

11:30 – 13:00 Common lunch and end of course