Federal Office for Radiation Protection

12th Interrad Course, 2024
Course Programme

RadoNorm

Online Course					
Time	**Monday, April 15th**	**Tuesday, April 16th**	**Wednesday, April 17th**	**Thursday, April 18th**	**Friday, April 19th**
9:00 - 10:30	Introduction of RadoNorm, BfS	Radiation Epidemiology II	Internal Dosimetry I	Radiation Risk Assessment	Molecular Epidemiology
10:30 - 11:00	**Coffee break**				
11:00 - 12:30	Radiation Epidemiology I	Radiation Biology I	Internal Dosimetry II	Q and A session Epidemiology and Risk Assessment	Advanced Methods: Proteome Research in Radiation Research
12:30 - 13:30	**Lunch break**				
13:30 - 15:00	Radiation Physics I	Cytogenetic methods in Biodosimetry	Radiation Biology II	Radiation Physics III Microdosimetry	International radon regulations and mitigation strategies
15:00 - 15:30	**Coffee break**				
15:30 - 17:00	Radiation Physics II	Advanced methods: mFISH analysis with excercises	Radiation Epidemiology III Radon studies	Classical methods in Radiation Biology	Final Discussion - Feedback Session
17:00 - 17:15	**Tea break**				
17:15 - 18:00	Q and A session to deepen the days topics	Q and A session to deepen the days topics	Q and A session to deepen the days topics	Q and A session Biology	

This project has received funding from the Euratom research and training programme 2019-2020 under grant agreement No 900009.

Subject	Description	Presenter	Description of Presenter	Picture
Introduction to BfS, RadoNorm and presentation of participants	Introduction in the RadoNorm project. Outline of the different research disciplines in radiation protection at the BfS and worldwide, radiation protection organizations and international research projects with interdisciplinary collaboration in the low dose area	Dr. Maria Gomolka (Course organizer) and Dr. Warren John (RadoNorm)	Maria Gomolka has a PhD in Biology and is senior scientist at the BfS since 1998. She is an expert on radiation biology and molecular epidemiology and responsible for biobanking at the BfS. She lectures at the LMU and TU in different Master´s degree programs. She coordinates now the 12th InterRad course.	
			Warren John, originally from Sri Lanka, has a PhD in Biochemistry from Jacobs University Bremen in Germany, with a specialisation in plant biochemistry. His postdoc was at the Helmholtz Zentrum Dresden-Rossendorf on the uptake of uranium into plants, where he got into the field of radiation protection and the RadoNorm project. Since 2022 he transitioned to BfS to the RadoNorm coordination team and now has taken up his new role as coordinator of the project.	
Radiation Physics I	Physical basics of radioactivity and ionizing radiation: instability and decay of the atomic nuclei, origin of radionuclides, nature & characteristics of different types of radiation, interaction with matter.	Dr. Rainer Merk	Dr. Merk is a physicist and senior scientist in the BfS section Radioecology. His main area of expertise is mathematical modeling of radiation exposure by means of computers, for example Monte Carlo simulation.	
Radiation Physics II	Physical characteristics of different types of ionizing radiation, different dose concepts (absorbed dose, equivalent dose, effective dose). Basic principles of dose calculation for different exposure situations (external and internal exposure).	Dr. Rainer Merk		
Radiation Physics III	Micro- and nanodosimetry: Dosimetry at small spatial scales, and their relevance for biological effects at different levels of organisation. Monte Carlo simulations and detection principles	Dr. Balázs Madas	Balázs Madas is a senior research fellow at the Environmental Physics Department of HUN-REN Centre for Energy Research, Budapest, Hungary. He obtained his PhD in Physics. Modelling biological systems is his main research field, where he mostly focuses on the biological response to ionizing radiation. In his models, there is almost always a link between death and variability, nowadays between cell death and mutagenesis. He has been studied the biological effects of inhaled radon progeny for a while (now @RadoNorm) learning a lot about internal (alpha) dosimetry, and a little about aerosol transport.	

Subject	Description	Presenter	Description of Presenter	Picture
Internal Dosimetry I	Dose assessment for incorporation of radionuclides, with focus on uranium miners	Dr. Augusto Giussani	Augusto Giussani is the head of the Unit "External and internal dosimetry, biokinetics" at the Federal Office of Radiation Protection BfS. His main field of activity is biokinetics of radionuclides and internal dosimetry. He is member of Committee 2 of the International Commission on Radiological Protection ICRP and leads the Task Group on "Dose to patients in diagnostic nuclear medicine".	
Internal Dosimetry II	Dosimetrical approaches after exposures of workers and public to radon and radon progeny	Dr. Augusto Giussani		
Radiation Epidemiology I	Introduction to radiation epidemiology, measures of disease occurrence and risk, epidemiological study designs	Dr. Nora Fenske	Nora Fenske has a PhD in statistics and has been working as a scientist at the BfS since 2014. She is an expert on radiation epidemiology and related statistical methods. Her research focusses on the German uranium miners cohort study and health risks from radon. She likes teaching and lectures at the LMU and TU in different Master´s degree programs.	
Radiation Biology I	Radiation effects in biological systems: damage on the molecular and cellular level	PD Dr. Simone Mörtl	PD Dr. Simone Moertl is the head of Section WR1 "Radiation Biology" at the Federal Office for Radiation Protection Germany and she is a member of the Medical Faculty of the Technical University Munich. Her research focusses on the cellular radiation response of tumour and normal tissues to identify key structures and pathways for radiation sensitivity/resistance. She is particularly interested in the role of vesicle-mediated (e.g. exosomes) cell-cell communication processes during radiation response.	
Radiation Epidemiology II	Basic concepts of radiation epidemiology based on examples for radon: confounding, selection bias, information bias, chance, causality	Dr. Peter Scholz-Kreisl	Dr. rer. physiol. Peter Scholz-Kreisel MSc is head of the section “Radiation epidemiology and risk assessment at the German Federal Office for Radiation Protection. He is a biologist and epidemiologist by training. Main research focus are long-term health effects due to medical, occupational or accidental exposure to ionizing radiation.	
Radiation Risk Assessment	Risk and uncertainty assessment in radiation epidemiology based on examples for radon: risk measurements, systematic reviews, meta analyses, process of risk assessment, major committees and institutions	Dr. Peter Scholz-Kreisl		

Subject	Description	Presenter	Description of Presenter	Picture
Radiation Biology II	Radiation induced damage on tissue-, organ-, organism- and population-level; Different type of radiation damage: stochastic / deterministic effects, targeted and non targeted effects, non-cancer effects; inflammatory effects	PD Dr. Simone Mörtl		
International radon regulations and mitigation strategies	Radon maps, radon risk areas and mitigation strategies, international regulations, occupational and population risk	Dr. Bernd Hoffmann	Bernd Hoffmann holds a PhD in physics and has been working at the BfS since 2007. He is head of the section “Radon and NORM” (NORM = Naturally Occurring Radioactive Materials). He has been working in this field for around 25 years and is a member of several relevant national and European committees. He is also involved in the response-Team to nuclear security events.	
Classical methods in Radiation Biology	Introduction to clonogenic cell survival assays, mutagenic and RF assays; protein analysis techniques	Dr. Prabal Subedi	Prabal has a degree in Chemistry and is trained in mass spectrometry-based proteomics. His focus at BfS is individual radiosensitivity: why do certain individuals react adversely to ionizing radiation? He also teaches in the Master of Radiation Biology program (TU Munich). When not at work, he is most likely to be found wandering in the mountains.	
Molecular Epidemiology	Link between epidemiological studies and radiation biology including -omics methods; Biobanks for radiation research	Dr. Maria Gomolka		
Radiation Epidemiology III	Radon epidemiology: uranium miner cohort studies, indoor radon case-control studies	Dr. Nora Fenske		
Cytogenetic methods in Biodosimetry	Cytogenetic methods and their use in Biodosimetry	Dr. Ursula Oestreicher	Ursula Oestreicher holds a PhD in biology and is head of the Section Biological Dosimetry at BfS. She was involved in different EU and international projects as MULTIBIODOSE (FP7 Security, GA24153), RENEB (FP7 EURATOM, GA295513), EPI-CT (FP7, GA269912) and BALANCE (PTE Federal Award No: 5U19AI067773-14). Since October 2021, she holds the chair of the RENEB association (Running the European Network of Biological Dosimetry and Physical retrospective Dosimetry).	

Subject	Description	Presenter	Description of Presenter	Picture
Advanced Methods: mFISH	Introduction in the method and exercises	Dr. Martin Bucher	Martin Bucher, PhD, is biologist in the section “Biological Dosimetry” at the Federal Office for Radiation Protection in Germany. Since 2015, he has been working at the BfS. As part of his doctoral thesis, he worked on the topics of radiation sensitivity and chronic radiation exposure with a focus on radiation-induced foci and chromosomal aberrations. Since 2020, his focus has moved to cytogenetic methods in the context of biological dosimetry and the integration of automated evaluation strategies and high-throughput methods.	
Advanced Methods: Proteomics in Radiation Research	Introduction and application of modern proteomic analysis	Dr. Prabal Subedi		
Tracing Radon	Introduction how radon can be measured in houses and what needs to be considered for exposure assessment	Dr. Martin Dubslaff	Martin Dubslaff is a scientific officer in the field of radon metrology at BfS since 2013. He holds a PhD in Physics and is the technical head of the BfS radon calibration laboratory in Berlin	
Tracing Radioactivity in food	Practical training	Dr. Eva Kabai	She studied chemistry and physics, she holds a PhD in radiochemistry by the Technical University of Budapest. Since 2008 working as scientific officer on topics related to environmental radioactivity monitoring at the BfS. She is head of the Radioecology laboratory and her interests are related to the development of fast radioanalytical methods for the determination of radioisotopes in environmental and food samples.	
Tracing Radioactivity in the human body	Practical training	Oliver Meisenberger	Oliver Meisenberg is head of the internal monitoring workgroup. His research interests comprise response to radiological emergencies, exposure of the public to environmental radioactivity and the development of new methods in internal monitoring.	
Tracing Radioactivity in the environment	Practical training	Dr. Christophe Strobl	Dr. Christopher Strobl is the head of the Section "Emissions / Immissions Air" at the Federal Office of Radiation Protection (BfS). His key activities are the quality assurance of the self-monitoring of German nuclear facilities, the determination of radiation exposure for the population in the vicinity of nuclear facilities and the aero gamma spectrometry	

Subject	Description	Presenter	Description of Presenter	Picture
Laboratory Session - Cytogenetics	Practical training	Dr. Ursula Oestreicher/ Dr. Martin Bucher		
Laboratory Session - GammaH2AX	Practical training	Dr. Ute Rößler/Dr. Andreas Wörner	I have been working as a scientific consultant at the Federal Office for Radiation Protection for more than 20 years. My main topics are the use of the gamma-H2AX and other foci assays in emergency response. I am also responsible for training biology laboratory technicians.	
Laboratory Session - Gene expression	Practical training	Dr. Andreas Wörner	Andreas Wörner studied Biochemistry and Biophysical Chemistry at the JW Goethe-University of Frankfurt a. M., where he started his research on light-driven membrane proteins by NMR. For his PhD from the LMU he then moved to Munich to study cellular processes and proteomic properties in the field of toxic protein misfolding and neurodegeneration at the Max-Planck-Institute of Biochemistry. Andreas started 2023 at the BfS as a senior scientist investigating biological effects of radiation and teaching Master students at the TU Munich.	

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Federal Office for Radiation Protection

12th Interrad Course, 2024
Course Programme (Part 2)

RadoNorm

Laboratory Training Course
BfS Neuherberg (Munich)

Time	*Monday, 22.04.24*	*Tuesday, 23.04.24*	*Wednesday, 24.04.24*	*Thursday, 25.04.24*	*Friday,26.04.24*
08:30 - 09:00	**Welcome in Munich Lab Safety Introduction**				
09.00 -10.45	**Tracing radioactivity: in food (group A) in human body(group B)**	**Tracing radioactivity: in human body (group A) in environment (group B)**	**Tracing radioactivity: in environment (group A) in food (group B)**	**09:00 -15:00 (Group2) Laboratory Session: Cytogenetic methods**	**Tracing Radon**
11.00 - 17.00 (*incl. Lunch Break)*	**(Group1) Introduction to Biological Dosimetry Laboratory Session: Cytogenetic methods**	**(Group1) Laboratory Session: Cytogenetic methods**	**(Group2) Introduction to Biological Dosimetry Laboratory Session: Cytogenetic methods**	**09:00 - 15:00 (Group1) Laboratory Session: Gamma H2AX**	**Results GammaH2AX Gene Expression 11:00-12:30** **13:00 Success check**
11.00 - 17.00 (*incl. Lunch Break)*	**(Group2) Laboratory Session: GammaH2AX Assay Genexpression *open end (depends on assay)***	**(Group2) Laboratory Session: Gamma H2AX *open end (depends on assay)***	**(Group1) Laboratory Session: Gamma H2AX Genexpression *open end (depends on assay)***	**15:15 - open end Both groups Tracing Radon**	14:00-15:30 Feedback Discussion Certificates Closing FRM II Garching (optional)

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